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SECTION1 SUMMARY
KEY TO ABBREVIATIONS

A	AC	:Alternating Current
	ACC	:Automatic Color Control
	ACSS	:Automatic Channel Setting System
	ADJ	:Adjust
	A/E	:Audio Erase
	AFC	:Automatic Frequency Control
	AFT	:Automatic Fine Tuning
	AGC	:Automatic Gain Control
	A.H.SW	:Audio Head Switch
	ALC	:Automatic Level Control
	AM	:Amplitude Modulation
	AMP	:Amplifier
	ANT	:Antenna
	APC	:Automatic Phase Control
	ASS'Y	:Assembly
	AUX	:Auxiliary
B	B	:Base
	BGP	:Burst Gate Pulse
	BPF	:Bandpass Filter
	BS	:Brodcasting Satellite
	BW or B/W	:Black and White
C	C	:Capacitor, Chroma, Collector
	CAN	:Cancel
	CAP	:Capstan
	CAP.BRK	:Capstan Brake
	CAP.RVS	:Capstan Reverse
	CATV	:Cable Television
	CBA	:Circuit Board Assembly
	CCD	:Charge Coupled Device
	C.CTL	:Chro Control, Capstan Control
	CFG	:Capstan Frequency Generator
	CHROMA	:Chrominance
	CNR	:Chroma Noise Redution
	COMB	:Combination Comb Filter
	COMP	:Comparator Composite Compensation
	CONV	:Converter
	C.ROT SW	:Color Rotary Switch
	CS	:Chip Selcet
	C.SYNC	:Composite Synchronization
	CTL DIV	:Control Divide
	CUR	:Current
	CYL	:Cylinder
D	D	:Drum, Digital, Diode, Drain
	D.ADJ	:Drum Adjust
	DC	:Direct Current
	D.CTL	:Drum Control
	DEMOD	:Demodulator
	DET	:Detector
	DEV	:Deviation
	DHP	:Double High Pass
	DIGITRON	:Digital Display Tube
	DL	:Delay line
	DOC	:Drop Out Compensator
	DUB	:Dubbing
	D.V SYNC	:Dummy Vertical Synchronization
E	E	:Emitter
	EE	:Electric to Eletric
	EMPH	:Emphasis
	ENA	:Enable
	ENV	:Envelope
	EP	:Extended Play
	EQ	:Equalizer
	EXP	:Expander
F	F	:Fuse
	FB	:Feed Back
	FBC	:Feed Back Clamp
	FE	:Full Erase
	FG	:Frequency Generator
	FL	:Filter
	FM	:Frequency Modulation
	F/R	:Front/Rear
	FS	:Frequency Synthesizer
	FSC	:Subcarrier Frequency
	F/V	:Frequency Voltage
G	GEN	:Generator
H	H	:High, Horizontal
I	IC	:Integrated Circuit
	IF	:Intermediate Frequency
	INS	:Insert
L	L	:Low, Left, Coil
	LD	:LED
	LD VTG CTL	:Loading Voltage Control
	LECHA	:Letter Character
	L.M	:Level Meter
	LP	:Long Play
	LPF	:Low Pass Filter
M	MAX	:Maximum
	MD	:Modulator
	MECHA.CTL	:Mechanism Control
	MIC	:Microphone
	MIN	:Minimum
	MIX	:Mixer, Mixing
	M.M.	:Monostable, Multivibrator
	MMV	:Mono Multi Vibrator
	MOD	:Modulation, Modulator
	MODEM	:Modulator-Demodulator
	MPX	:Multiplex
N	NR	:Noise Reduction
O	OSC	:Oscillator
	OSD	:On Screen Display
P	PB	:Playback
	PCB	:Printed Circuit Board
	P.CTL	:Power Control
	PRE-AMP	:Preamplifier
	P.F	:Power Failure
	PG	:Pulse Generator
	PLL	:Phase Locked Loop
	PREM.DET	:Premire Detect
	P.P	:Peak-to-Peak
	PS	:Phase Shift
	PWM	:Pulse Width Modulation
	PWR CTL	:Power Control
Q	Q	:Transistor
	QH	:Quasi Horizontal
	QSR	:Quick Setting Record
	QTR	:Quick Timer Record
	QV	:Quasi Vertical
R	R	:Resistor, Right
	RE(or RC)	:Remocon, Receiver
	REC	:Recording
	REC S 'H'	:Record Start 'Hight'
	REF	:Reference
	REG	:Regulated, Regulator
	REMOCON	:Remote Control(unit)
	RF	:Radio Frequency
	R/P	:Record/Playback
	RTC	:Reel Time Counter
S	S	:Serial
	S.ACCEL	:Slow Accel
	SAOP	:Second Audio Program
	SC	:Scart, Simulcast
	S.DET	:Secam Detect
	SH	:Shift
	SHARP	:Sharpness
	SIF	:Sound Intermediate Frequency
	SLD	:Side Locking
	S/N	:Signal to Noise Ratio
	SP	:Standard Play
	ST	:Stereo
	SUB	:Subtract, Subcarrier
	SW or S/W	:Switch
	SYNC	:Synchronization
	SYSCON	:System Control
T	T	:Coil
	TP	:Test Point
	TR	:Transistor
	TRK	:Tracking
	TRANS	:Transformer
	TU	:Tuner, Take-up
U	UHF	:Ultra High Frequency
	UNREG	:Unregulated
V	V	:Volt, Vertical
	VA	:Always Voltage
	VCO	:Voltage Controlled Oscillator
	VGC	:Voltage Gain Control
	VHF	:Very High Frequency
	V.H.SW	:Video Head Switch
	VISS	:VHS Index Search
	VPS	:Video Program System
	VR	:Variable Resistor or Volume
	V-SYNC	:Vertical Synchronization
	VTG	:Voltage
	VV	:Voltage to Voltage
	VXO	:Voltage X-tal Oscillator
W	W	:Watt
	WHT	:White
	W/O	:With out
X	X-TAL	:Crystal
Y	Y/C	:Luminance/Chrominance
	YNR	:Luminance Noise Reduction
Z	ZD	:Zener Diode

PRODUCT SAFETY SERVICING GUIDELINES FOR VIDEO PRODUCTS

CAUTION : DO NOT ATTEMPT TO MODIFY THIS PRODUCT IN ANY WAY, NEVER PERFORM CUSTOMIZED INSTALLATIONS WITHOUT MANUFACTURER'S APPROVAL. UNAUTHORIZED MODIFICATIONS WILL NOT ONLY VOID THE WARRANTY, BUT MAY LEAD TO YOUR BEING LIABLE FOR ANY RESULTING PROPERTY DAMAGE OR USER INJURY.

SERVICE WORK SHOULD BE PERFORMED ONLY AFTER YOU ARE THOROUGHLY FAMILIAR WITH ALL OF THE FOLLOWING SAFETY CHECKS AND SERVICING GUIDELINES. TO DO OTHERWISE, INCREASES THE RISK OF POTENTIAL HAZARDS AND INJURY TO THE USER.

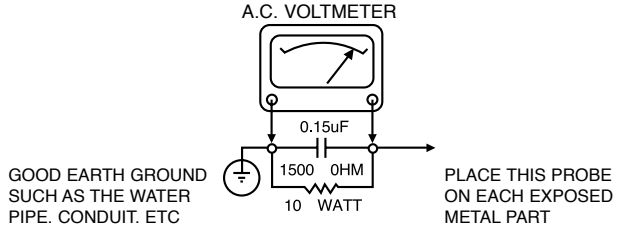
WHILE SERVICING, USE AN ISOLATION TRANSFORMER FOR PROTECTION FROM A.C. LINE SHOCK.

SAFETY CHECKS

AFTER THE ORIGINAL SERVICE PROBLEM HAS BEEN CORRCTED. A CHECK SHOULD BE MADE OF THE FOLLOWING.

SUBJECT : FIRE & SHOCK HAZARD

1. BE SURE THAT ALL COMPONENTS ARE POSITIONED IN SUCH A WAY AS TO AVOID POSSIBILITY OF ADJACENT COMPONENT SHORTS. THIS IS ESPECIALLY IMPORTANT ON THOSE MODULES WHICH ARE TRANSPORTED TO AND FROM THE REPAIR SHOP.
2. NEVER RELEASE A REPAIR UNLESS ALL PROTECTIVE DEVICES SUCH AS INSULATORS, BARRIERS, COVERS, SHIELDS, STRAIN RELIEFS, POWER SUPPLY CORDS, AND OTHER HARDWARE HAVE BEEN REINSTALLED PER ORIGINAL DESIGN. BE SURE THAT THE SAFETY PURPOSE OF THE POLARIZED LINE PLUG HAS NOT BEEN DEFEATED.
3. SOLDERING MUST BE INSPECTED TO DISCOVER POSSIBLE COLD SOLDER JOINTS, SOLDER SPLASHES OR SHARP SOLDER POINTS. BE CERTAIN TO REMOVE ALL LOOSE FOREIGN PARTICLES.
4. CHECK FOR PHYSICAL EVIDENCE OF DAMAGE OR DETERIORATION TO PARTS AND COMPONENTS. FOR FRAYED LEADS, DAMAGED INSULATION (INCLUDING A.C. CORD). AND REPLACE IF NECESSARY FOLLOW ORIGINAL LAYOUT, LEAD LENGTH AND DRESS.
5. NO LEAD OR COMPONENT SHOULD TOUCH A RECIVING TUBE OR A RESISTOR RATED AT 1 WATT OR MORE. LEAD TENSION AROUND PROTRUNING METAL SURFACES MUST BE AVOIDED.
6. ALL CRITICAL COMPONENTS SUCH AS FUSES, FLAMEPROOF RESISTORS, CAPACITORS, ETC. MUST BE REPLACED WITH EXACT FACTORY TYPES, DO NOT USE REPLACEMENT COMPONENTS OTHER THAN THOSE SPECIFIED OR MAKE UNRECOMMENDED CIRCUIT MODIFICATIONS.
7. AFTER RE-ASSEMBLY OF THE SET ALWAYS PERFORM AN A.C. LEAKAGE TEST ON ALL EXPOSED METALLIC PARTS OF THE CABINET, (THE CHANNEL SELECTOR KNOB, ANTENNA TERMINALS. HANDLE AND SCREWS) TO BE SURE THE SET IS SAFE TO OPERATE WITHOUT DANGER OF ELECTRICAL SHOCK. DO NOT USE A LINE ISOLATION TRANSFORMER DURING THIS TEST USE AN A.C. VOLTMETER, HAVING 5000 OHMS PER VOLT OR MORE SENSITIVITY, IN THE FOLLOWING MANNER; CONNECT A 1500 OHM 10 WATT RESISTOR, PARALLELED BY A .15 MFD. 150.V A.C TYPE CAPACITOR BETWEEN A KNOWN GOOD EARTH GROUND (WATER PIPE, CONDUIT, ETC.) AND THE EXPOSED METALLIC PARTS, ONE AT A TIME. MEASURE THE A.C. VOLTAGE ACROSS THE COMBINATION OF 1500 OHM RESISTOR AND .15 MFD CAPACITOR. REVERSE THE A.C. PLUG AND REPEAT A.C. VOLTAGE MEASUREMENTS FOR EACH EXPOSED METALLIC PART. VOLTAGE MEASURED MUST NOT EXCEED 75 VOLTS R.M.S. THIS CORRESPONDS TO 0.5 MILLIAMP A.C ANY VALUE EXCEEDING THIS LIMIT CONSTITUTES A POTENTIAL SHOCK HAZARD AND MUST BE CORRECTED IMMEDIATELY.


A.C. VOLTMETER
0.15uF
1500 0HM
10 WATT
GOOD EARTH GROUND SUCH AS THE WATER PIPE. CONDUIT. ETC
PLACE THIS PROBE ON EACH EXPOSED METAL PART

SUBJECT: GRAPHIC SYMBOLS

THE LIGHTNING FLASH WITH APROWHEAD SYMBOL. WITHIN AN EQUILATERAL TRIANGLE, IS INTENDED TO ALERT THE SERVICE PERSONNEL TO THE PRESENCE OF UNINSULATED "DANGEROUS VOLTAGE" THAT MAY BE OF SUFFICIENT MAGNITUDE TO CONSTITUTE A RISK OF ELECTRIC SHOCK.

THE EXCLAMATION POINT WITHIN AN EQUILATERAL TRIANGLE IS INTENDED TO ALERT THE SERVICE PERSONNEL TO THE PRESENCE OF IMPORTANT SAFETY INFORMATION IN SERVICE LITERATURE.

SUBJECT : X-RADIATION

1. BE SURE PROCEDURES AND INSTRUCTIONS TO ALL SERVICE PERSONNEL COVER THE SUBJECT OF X-RADIATION. THE ONLY POTENTIAL SOURCE OF X-RAYS IN CURRENT T.V. RECEIVERS IS THE PICTURE TUBE. HOWEVER, THIS TUBE DOES NOT EMIT X-RAYS WHEN THE HIGH VOLTAGE IS AT THE FACTORY SPECIFIED LEVEL. THE PROPER VALUE IS GIVEN IN THE APPLICABLE SCHEMATIC. OPERATION AT HIGHER VOLTAGES MAY CAUSE A FAILURE OF THE PICTURE TUBE OR HIGH VOLTAGE SUPPLY AND, UNDER CERTAIN CIRCUMSTANCES, MAY PRODUCE RADIATION IN EXCESS OF DESIRABLE LEVELS.
2. ONLY FACTORY SPECIFIED C.R.T. ANODE CONNECTORS MUST BE USED. DEGAUSSING SHIELDS ALSO SERVE AS X-RAY SHIELD IN COLOR SETS, ALWAYS RE-INSTALL THEM.
3. IT IS ESSNTIAL THAT SERVICE PERSONNEL HAVE AVAILABLE AN ACCURATE AND RELIABLE HIGH VOLTAGE METER. THE CALIBRA TION OF THE METER SHOULD BE CHECKED PERIODICALLY AGAINST A REFERENCE STANDARD, SUCH AS THE ONE AVAILABLE AT YOUR DISTRIBUTOR.
4. WHEN THE HIGH VOLTAGE CIRCUITRY IS OPERATING PROPERLY THERE IS NO POSSIBILITY OF AN X-RADIATION PROBLEM. EVERY TIME A COLOR CHASSIS IS SERVICED. THE BRIGHTNESS SHOULD BE RUN UP AND DOWN WHILE MONITORING THE HIGH VOLTAGE WITH A METER TO BE CERTAIN THAT THE HIGH VOLTAGE DOES NOT EXCEED THE SPECIFIED VALUE AND THAT IT IS REGULATING CORRECTLY, WE SUGGEST THAT YOU AND YOUR SERVICE ORGANIZATION REVIEW TEST PROCEDURES SO THAT VOLTAGE REGULATION IS ALWAYS CHECKED AS A STANDARD SERVICING PROCEDURE. AND THAT THE HIGH VOLTAGE READING BE RECORDER ON EACH CUSTOMER'S INVOICE.
5. WHEN TROUBLESHOOTING AND MAKING TEST MEASUREMENTS IN A PRODUCT WITH A PROBLEM OF EXCESSIVE HIGH VOLTAGE, AVOID BEING UNNECESSARILY CLOSE TO THE PICTURE TUBE AND THE HIGH VOLTAGE SUPPLY. DO NOT OPERATE THE PRODUCT LONGER THAN IS NECESSARY TO LOCATE THE CAUSE OF EXCES SIVE VOLTAGE.
6. REFER TO HV. B+ AND SHUTDOWN ADJUSTMENT PROCEDURES DESCRIBED IN THE APPROPRIATE SCHEMATIC AND DIAGRAMS (WHERE USED).

SUBJECT: IMPLOSION

1. ALL DIRECT VIEWED PICTURE TUBES ARE EQUIPPED WITH AN INTE GRAL IMPLOSION PROTECTION SYSTEM, BUT CARE SHOULD BE TAKEN TO AVOID DAMAGE DURING INSTALLATION, AVOID SCRATCHING THE TUBE. IF SCRATCHED REPLACE IT.
2. USE ONLY RECOMMENDED FACTORY REPLACEMENT TUBES.

SUBJECT : TIPS ON PROPER INSTALLATION

1. NEVER INSTALL ANY PRODUCT IN A CLOSED-IN RECESS, CUBBYHOLE OR CLOSELY FITTING SHELF SPACE. OVER OR CLOSE TO HEAT DUCT, OR IN THE PATH OF HEATED AIR FLOW.
2. AVOID CONDITIONS OF HIGH HUMIDITY SUCH AS: OUTDOOR PATIO INSTALLATIONS WHERE DEW IS A FACTOR, NEAR STEAM RADIATORS WHERE STEAM LEAKAGE IS A FACTOR, ETC.
3. AVOID PALCEMENT WHERE DRAPERIES MAY OBSTRUCT REAR VENTING. THE CUSTOMER SHOULD ALSO AVOID THE USE OF DECORATIVE SCARVES OR OTHER COVERINGS WHICH MIGHT OBSTRUCT VENTILATION.
4. WALL AND SHELF MOUNTED INSTALLATIONS USING A COMMERCIAL MOUNTING KIT. MUST FOLLOW THE FACTORY APPROVED MOUNTING INSTRUCTIONS A PRODUCT MOUNTED TO A SHELF OR PLATFORM MUST RETAIN ITS ORIGINAL FEET (OR THE EQUIVALENT THICKNESS IN SPACERS) TO PROVIDE ADEQUATE AIR FLOW ACROSS THE BOTTOM, BOLTS OR SCREWS USED FOR FASTENERS MUST NOT TOUCH ANY PARTS OR WIRING. PERFORM LEAKAGE TEST ON CUSTOMIZED INSTALLATIONS.
5. CAUTION CUSTOMERS AGAINST THE MOUNTING OF A PRODUCT ON SLOPING SHELF OR A TILTED POSITION, UNLESS THE PRODUCT IS PROPERLY SECURED.
6. A PRODUCT ON A ROLL-ABOUT CART SHOULD BE STABLE ON ITS MOUNTING TO THE CART. CAUTION THE CUSTOMER ON THE HAZARDS OF TRYING TO ROLL A CART WITH SMALL CASTERS ACROSS THRESHOLDS OR DEEP PILE CARPETS.
7. CAUTION CUSTOMERS AGAINST THE USE OF A CART OR STAND WHICH HAS NOT BEEN LISTED BY UNDERWRITERS LABORATORIES, INC. FOR USE WITH THEIR SPECIFIC MODEL OF TELEVISION RECEIVER OR GENERICALLY APPROVED FOR USE WITH T.V.'S OF THE SAME OR LARGER SCREEN SIZE.
8. CAUTION CUSTOMERS AGAINST THE USE OF EXTENSION CORDS, EXPLAIN THAT A FOREST OF EXTENSIONS SPROUTING FROM A SINGLE OUTLET CAN LEAD TO DISASTROUS CONSEQUENCES TO HOME AND FAMILY.

SERVICING PRECAUTIONS

CAUTION : Before servicing the VCR covered by this service data and its supplements and addends, read and follow the SAFETY PRECAUTIONS. NOTE : if unforeseen circumstances create conflict between the following servicing precautions and any of the safety precautions in this publications, always follow the safety precautions.
Remembers Safety First:

General Servicing Precautions

1. Always unplug the VCR AC power cord from the AC power source before:
   (1) Removing or reinstalling any component, circuit board, module, or any other assembly.
   (2) Disconnection or reconnecting any internal electrical plug or other electrical connection.
   (3) Connecting a test substitute in parallel with an electrolytic capacitor.
   Caution : A wrong part substitution or incorrect polarity installation of electrolytic capacitors may result in an explosion hazard.

2. Do not spray chemicals on or near this VCR or any of its assemblies.

3. Unless specified otherwise in this service data, clean electrical contacts by applying an appropriate contact cleaning solution to the contacts with a pipe cleaner, cotton-tipped swab, or comparable soft applicator.
   Unless specified otherwise in this service data, lubrication of contacts is not required.

4. Do not defeat any plug/socket B+ voltage interlocks with whitch instruments covered by this service manual might be equipped.

5. Do not apply AC power to this VCR and/or any of its electrical assemblies unless all solid-state device heat sinks are cerrectly installed.

6. Always connect test instrument ground lead to the appropriate ground before connection the test instrument positive lead. Always remove the test instrument ground lead last.

Insulation Checking Procedure

Disconnect the attachment plug from the AC outlet and turn the power on. Connect an insulation resistance meter(500V) to the blades of the attachment plug. The insulation resistance between each blade of the attachment plug and accessible conductive parts (Note 1) should be more than 1M-ohm.

Note 1 : Accessible Conductive Parts including Metal panels, Input terminals, Earphone jacks, etc.

Electrostatically Sensitive (ES) Devices

Some semiconductor (solid state) devices can be damaged easily by static electricity. Such components commonly are called Electrostatically Sensitive (ES) Devices. Examples of typical ES devices are integrated circuits and some field effect transistors and semiconductor chip components.
The following techniques should be used to help reduce the incidence of component damage caused by static electricity.

1. Immediately before handling any semiconductor component or semiconductor-equipped assembly, drain off any electrostatic charge on your body by touching a known earth ground. Alternatively, obtain and wear a commercially available discharging wrist strap device, which should be removed for potential shock reasons prior to applying power to the unit under test.

2. After removing an electrical assembly equipped with ES devices, place the assembly on a conductive surface such as aluminum foil, to prevent electrostatic charge buildup or exposure of the assembly.

3. Use only a grouned-tip soldering iron to solder or unsolder ES devices.

4. Use only an anti-static solder removal device. Some solder removal devices not classified a “anti-static” can generate electrical charges sufficient to damage ES devices.

5. Do not use freon-propelled chemicals. These can generate electrical charge sufficient to damage ES devices.

6. Do not remove a replacement ES device from its protec tive package until immediately before you are ready to install it. (Most replacement ES devices are packaged with leads electrically shorted together by conductive foam, aluminum foil, or comparable conductive material).

7. Immediately before removing the protective material from the leads of a replacement ES device, touch the protective material to the chassis or circuit assembly into which the device will be installed.

   Caution : Be sure no power is applied to the chassis or circuit, and observe all other safety precautions.

8. Minimize bodily motions when handling unpackaged replacement ES devices. (Normally harmless motion such as the brushing together of your clothes fabric or the lifting of your foot from a carpeted floor can generate static electricity sufficient to damage an ES device.)

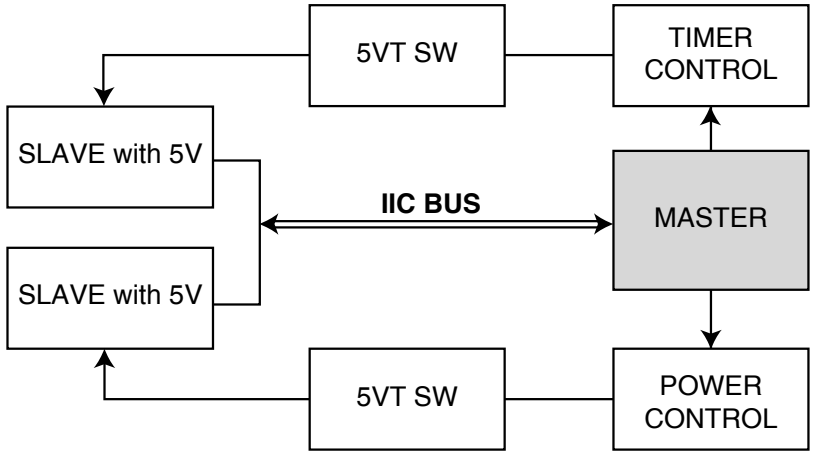
PROPOSAL FOR APPLYING SHORT PROTECTION

• The Contents of Examination

As all the IC that is applied to VCR is controlled by IIC, mutual communication, if Vcc of IC is short or open with detecting 'Acknowledge' data of the specific IC according to each power(5V, 5VT) μ-COM gets unable to detect 'ACK' data.

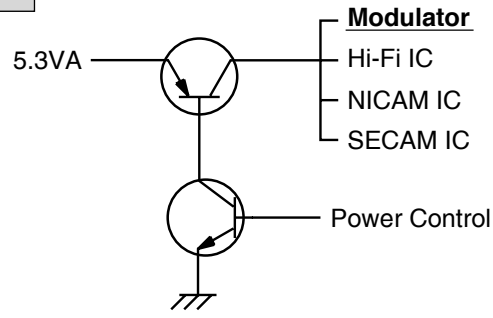
μ-COM regards this case as abnormal one and if it can't detect 'ACK' data for a certain time(3.5 sec) the signal of 'Power Control' and 'Timer Control' are switched to 'Low'. As a result POWER Switching TR is kept from generating heat and fire.

Conception BLOCK Diagram

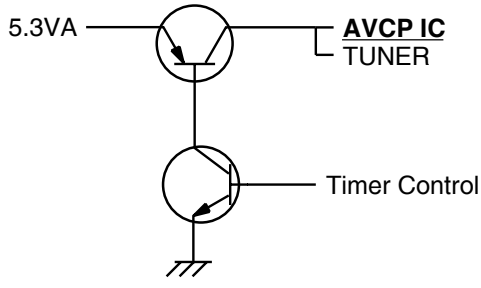


• POWER for each IC

5.2V



5.2VT



• IC to detect 'ACK' data is selected as below because IC is different in accordance to region and option

S/	5V POWER	SECAM IC
Series	5VT POWER	AVCP IC
P/Y/I	5V POWER	Modulator
Series	5VT POWER	AVCP IC

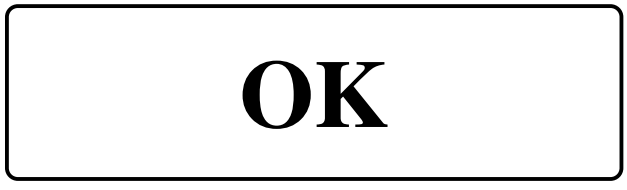
*Short protection off mode : DJ01 Diode in

SERVICE NOTICE ON REPLACING EEPROM

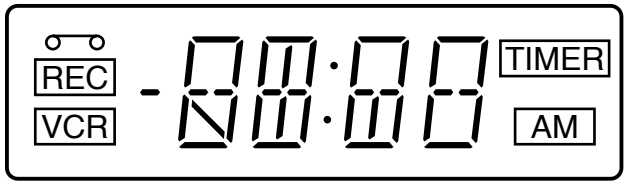
In case that defective EEPROM of PAL models is replaced, to operate these sets from the initial state MP KEY must be repaired as well before delivering to the customer.
If MP KEY isn't repaired the setting of RF OUT channel or LANGUAGE might be different from that for custormer's country.

•**MP KEY** : In case of PAL VCR if holding the REC button on the front panel and the CLEAR button on the remote control handset for 5 ~ 7 seconds with power being switch all and no tapes, OK is displayed at FLD for FLD models and LED becomes on for LED CLOCK models. This is the state that initializing EEPROM is finished.
(In case of PAL VCP if holding the REC button on the front panel and the MENU button on the remote control handset for 5 ~ 7 seconds with power being off and no tapes, All the LED DOTs become on. This is the state that initializing EEPROM is finished.)

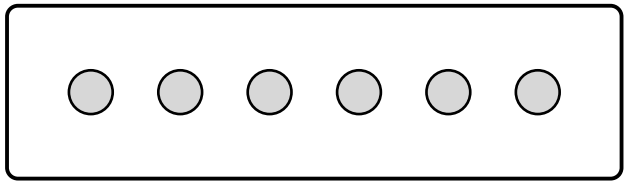
•**MP KEY's function** : MP KEY sets EEPROM's data up to the initial state.



• **FLD MODEL:**
MP KEY "OK"



• **LED CLOCK MODEL:**
MP KEY Switch all on a Light



• **LED DOT MODEL:**
MP KEY Switch all on a Light

SPECIFICATIONS

General

Power	110-240V~, 50/60Hz
Power consumption	Approx. 12 Watts
Video Head System	Double azimuth 4 heads, helical scanning (EC-530W)
	Rotary 2 heads, helical scanning (EC-330W)
Tape speed	PAL: 23.39 mm/sec (SP mode) 11.69 mm/sec (LP mode)
	NTSC: 33.35 mm/sec (SP mode) 11.12 mm/sec (LP mode)
Tape Format	Tape width 12.7mm (0.5 inch)
Max. recording time	PAL: 4 hours (SP mode, E-240 Tape)
	8 hours (LP mode, E-240 Tape)
	NTSC: 2 hours (SP mode, T-120 Tape)
	8 hours (EP mode, T-160 Tape)
Rewind time	Approx. 65 (±10) secs (E-180 tape)
Dimensions	360 x 82 x 230mm (W x H x D)
Weight	2.87 kg
Operating temperature	5º C - 35º C
Operating humidity	Less than 80%
Timer	24 hours display type

Video

Television system	CCIR standard (625 lines, 50 fields)
	PAL/SECAM colour signal
Recording format	PAL/MESECAM/NTSC 3.58/NTCS 4.43
RF reception	PAL SECAM (B/G, D/K, I/I)
RF OUT	PAL G/K/I
Input level	VIDEO IN (RCA) 1.0 Vp-p, 75 Ohm unbalanced
Output level	VIDEO OUT (RCA) 1.0 Vp-p, 75 Ohm unbalanced
Signal to noise ratio	More than 43 dBm
RF modulator	UHF channel 22-68 (Adjustable)

Audio

Input level	AUDIO IN (RCA) - 6.0 dBm, more than 47 kohms
Output level	AUDIO OUT (RCA) - 6.0 dBm, less than 1 kohms
Track	Mono track
Frequency response	100 Hz - 10 kHz (-6/+3 dBm)
Signal to noise ratio	More than 43 dB

SECTION2 CABINET & MAIN FRAME

SERVICE METHOD

(1) Disassembly Flow

Top Case

Bottom Cover

Front Panel

Housing & Deck Assembly

Main C.B.A

LED C.B.A

(2) Re-assembly Flow for service like Fig. 2-1

LED C.B.A

Main C.B.A

Housing & Deck Assembly

(3) To check and replace Electrical parts

① Disassemble the unit according to No.1) Disassembly Flow.

② Re-assemble the unit according to No.2) Re-assembly Flow.

③ Place the unit like Fig. 2-1

④ Check and replace Electrical parts.

NOTE :

① Insert Video Cassette Tape inversely like Fig. 2-1 to check and replace defective parts.

② In disassembling and reassembling, be careful not to damaged CST switch.

(Positioned Upside Down)

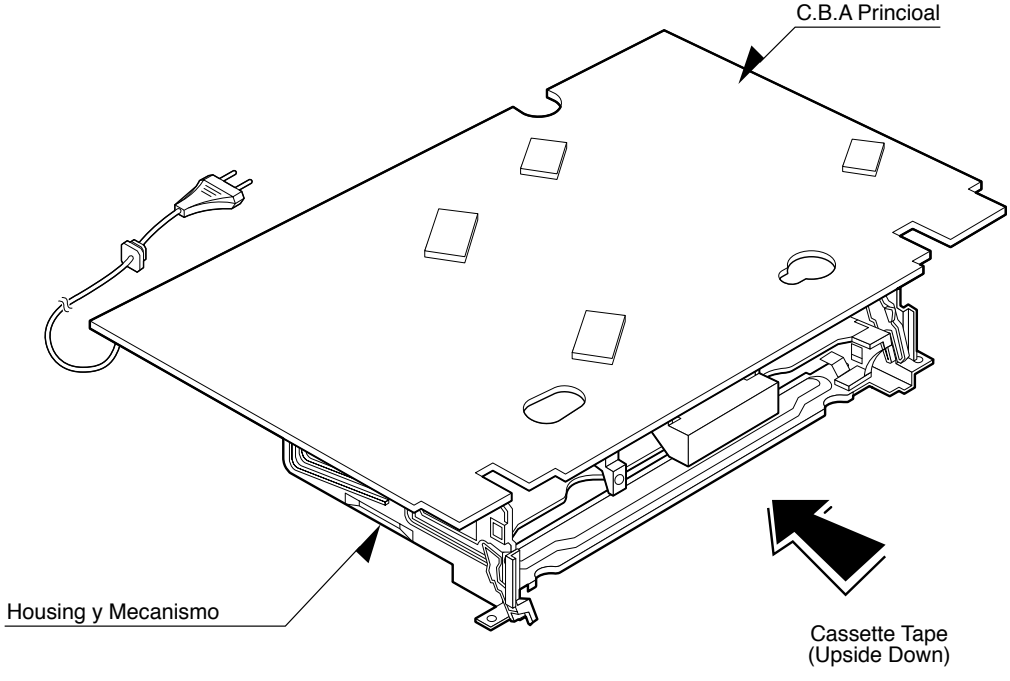
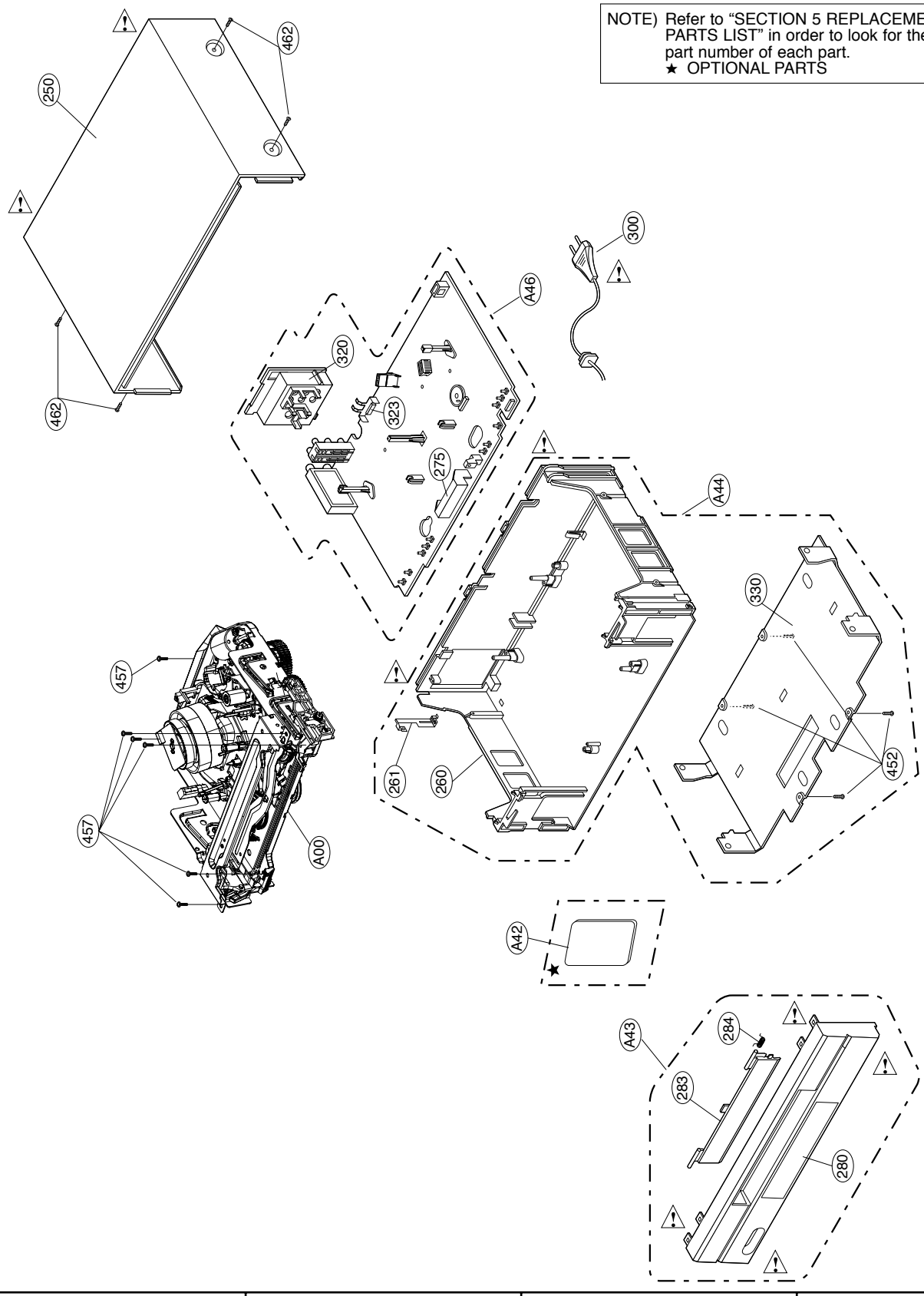


Fig.2-1

EXPLODED VIEWS

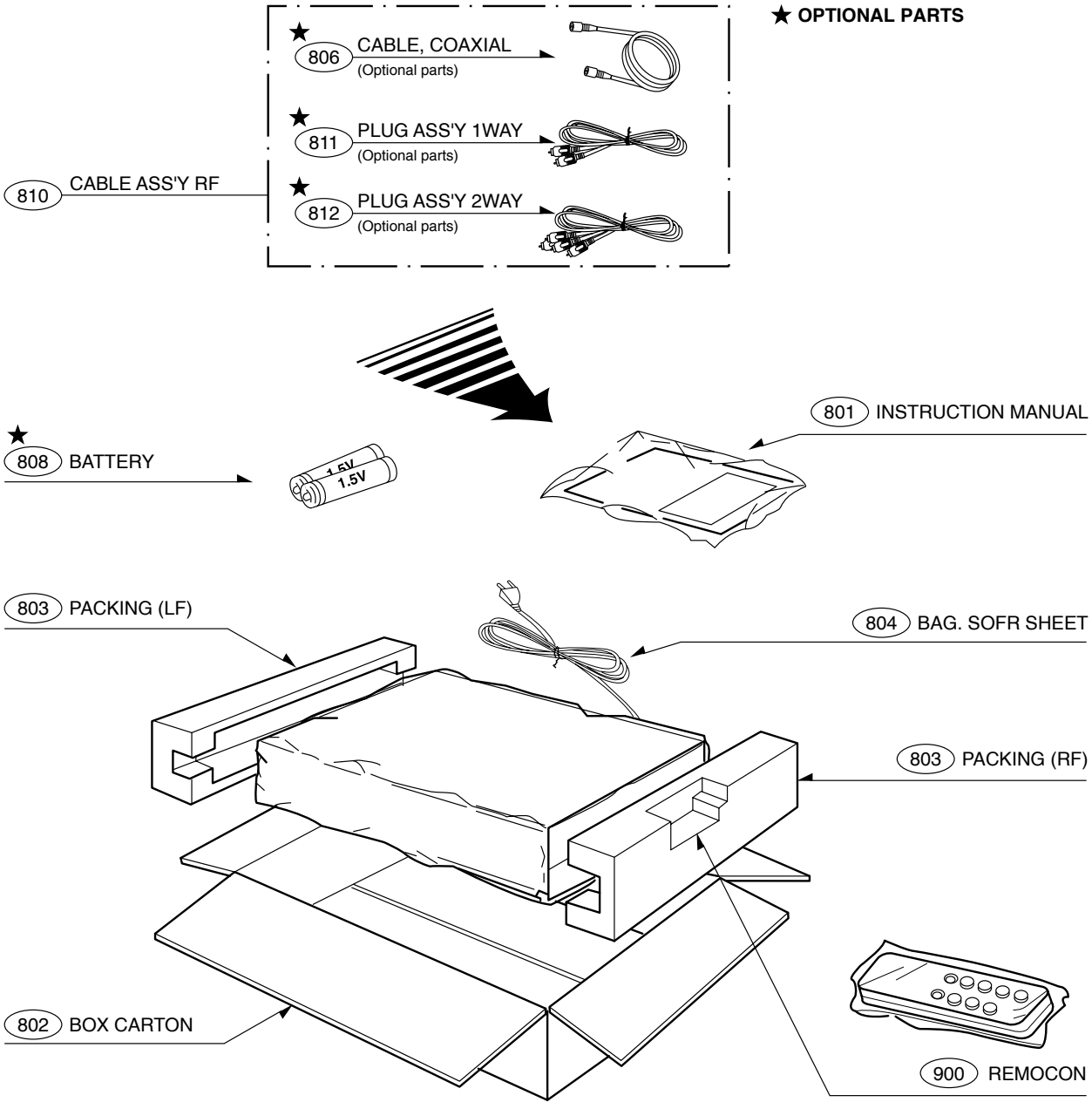
1. Cabinet and Main Frame Section

NOTE) Refer to “SECTION 5 REPLACEMENT PARTS LIST” in order to look for the part number of each part.
★ OPTIONAL PARTS



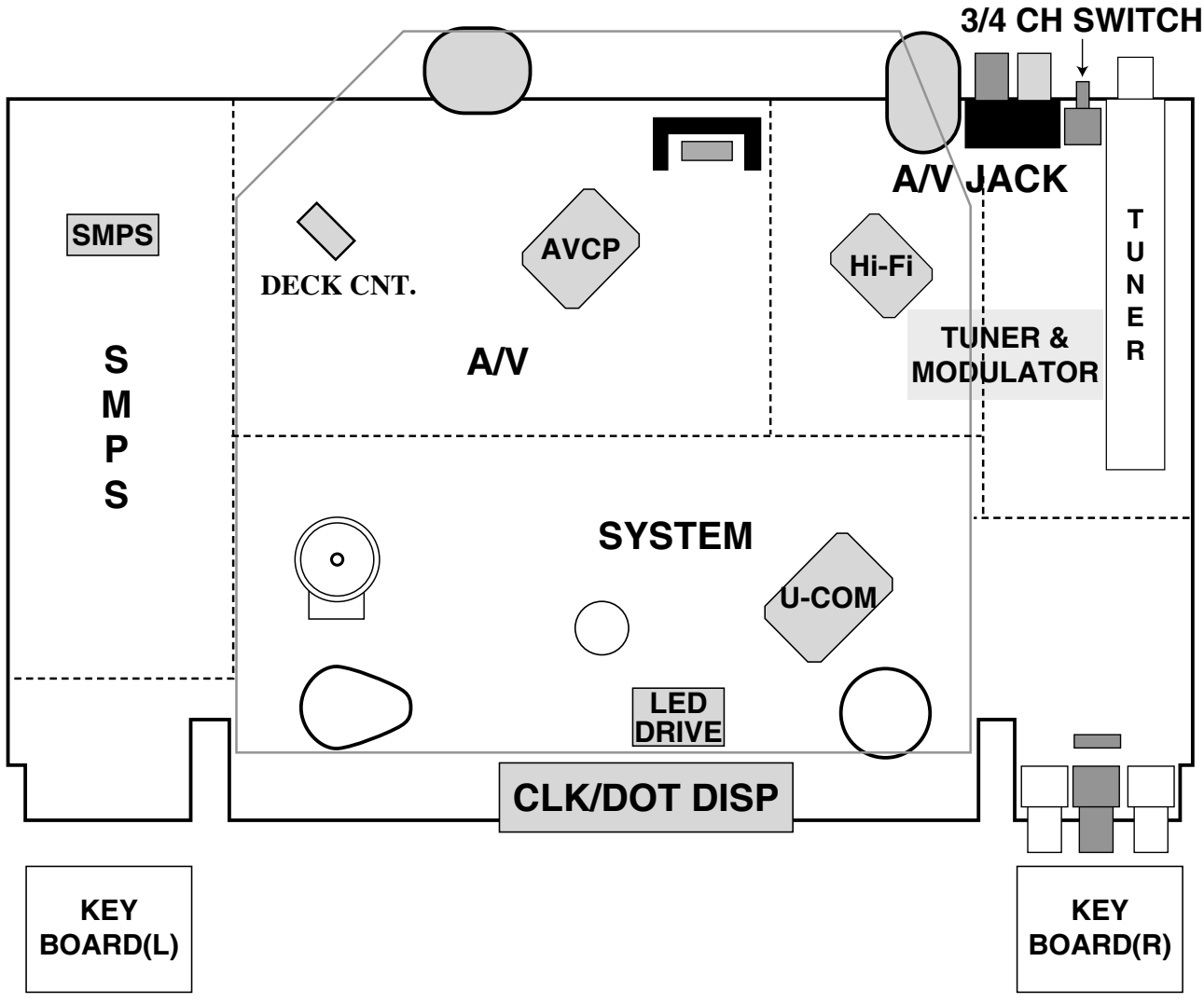
2.Packing Accessory Section

NOTE) Refer to “SECTION REPLACEMENT PARTS LIST in order to look for the part number of each part.



SECTION 3 ELECTRICAL
ELECTRICAL ADJUSTMENT POINTS ARRANGEMENT

: Measurement point
: Adjustment point



ELECTRICAL ADJUSTMENT PROCEDURES

1. Servo Adjustment

1) PG Adjustment

• Test Equipment

a) OSCILLOSCOPE
b) PAL TEST TAPE (VHS SP)
c) JIG REMOCON (AUTO PG SETTING)

• Adjustment And Specification

MODE	MEASUREMENT POINT	ADJUSTMENT POINT	SPECIFICATION
PLAY	V.Out H/SW(W714, W715)		6.5 ± 0.5H

• **Adjustment Procedure**

a) Insert the PAL SP Test Tape and play.
Note - Adjust the distance of X, pressing the Tracking(+) or Tracking(-) when the “ATR” is blink after the PAL SP Test Tape is inserted.

b) Press “Play” key on set and “0” key on Remocon.(Then check the blink “TRK OK” (Hi-Fi Model), “ALL LIGHT”(MONO Model) on CLK/LED
-TRK is a Initial)

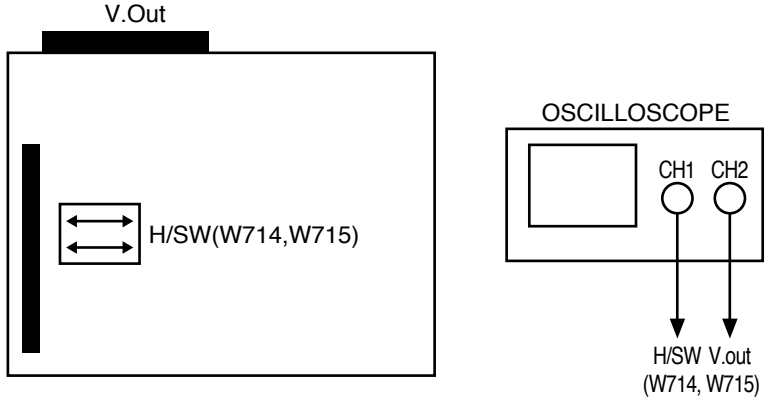
c) Press “Play” key on set and “0” key on Remocon again.(Then check the blink “PG NG > PG OK” on CLK/LED(Hi-Fi Model), Then check the blink “PG waveform” on oscilloscope(MONO Model)).

• **Check the PG**

a) Connect the CH1 of the oscilloscope to the H/SW and CD2 to the Video out for the VCR.

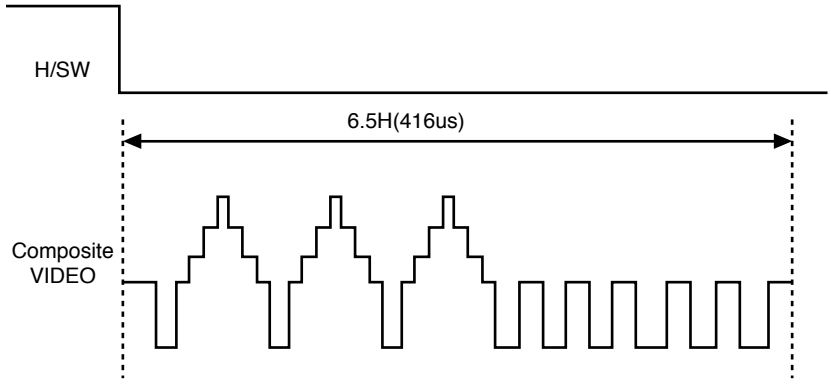
b) Trigger the mixed Video Signal of CH2 to the CH1 H/SW(W714, W715), and then check the distance (time difference), which is from the selected A(B) Head point of the H/SW(W714, W715) signal to the starting point of the vertical synchronized signal, to 6.5H ± 0.5H (416μs, 1H=64.0μs).

• **CONNECTION**



ELECTRICAL ADJUSTMENT PROCEDURES

• **WAVEFORM**



• **Attension and Reference**

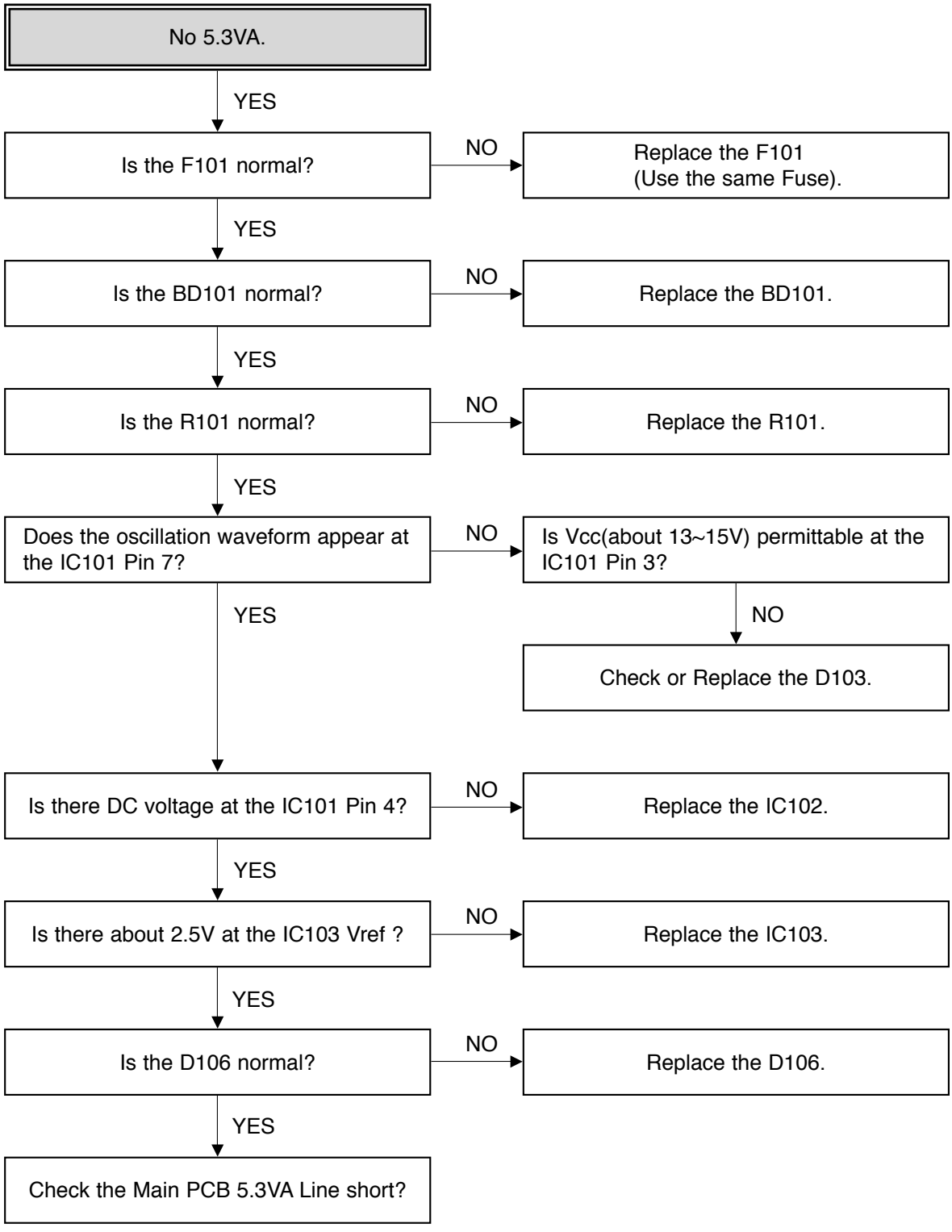
a) The PG checking must do when RF Level is Maximum and SERVO system is Locking (MTR MODE)

b) V.H/SW Level is 2Vpp.

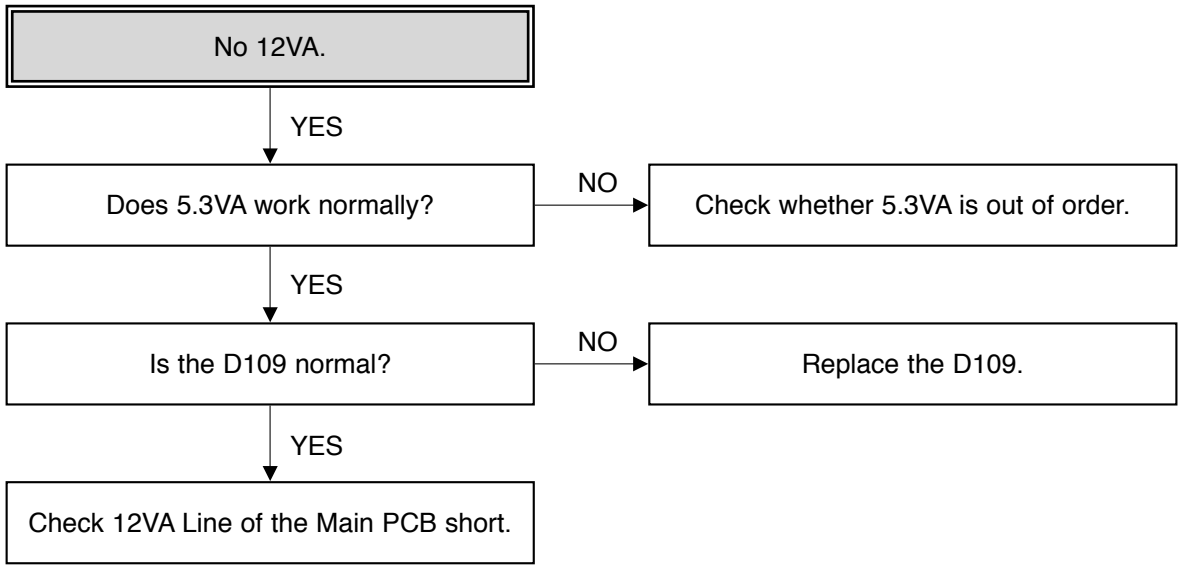
ELECTRICAL TROUBLESHOOTING GUIDE

1. Power Circuit(SMPS)

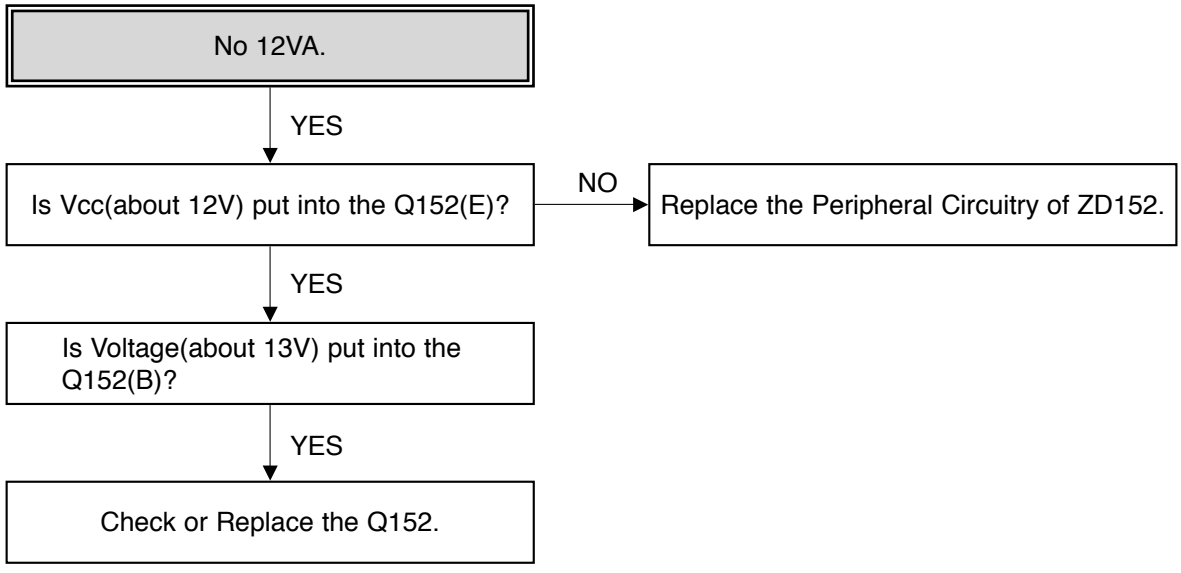
(1) No 5.3VA.



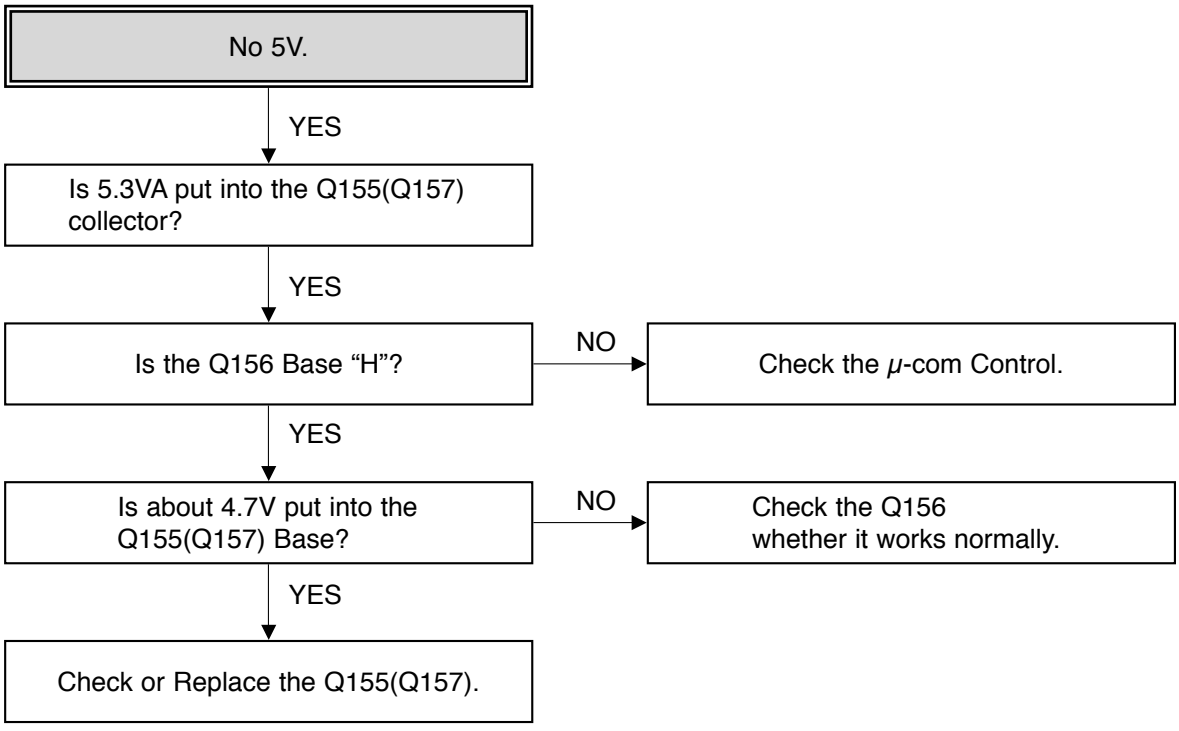
(2) No 12VA.(Capstan)



(3) No 12V (Hi-Fi, Buffer)

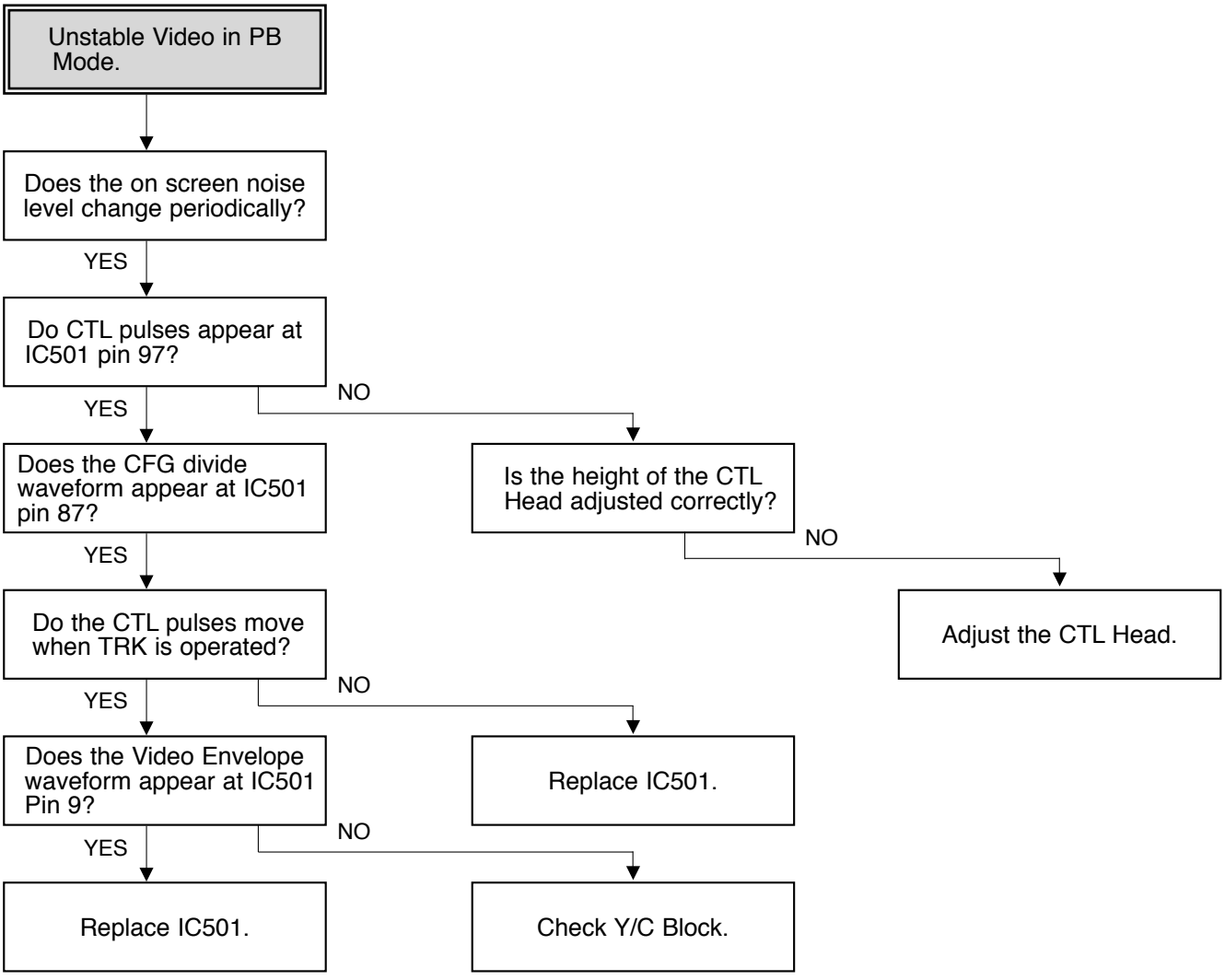


(4) No 5V

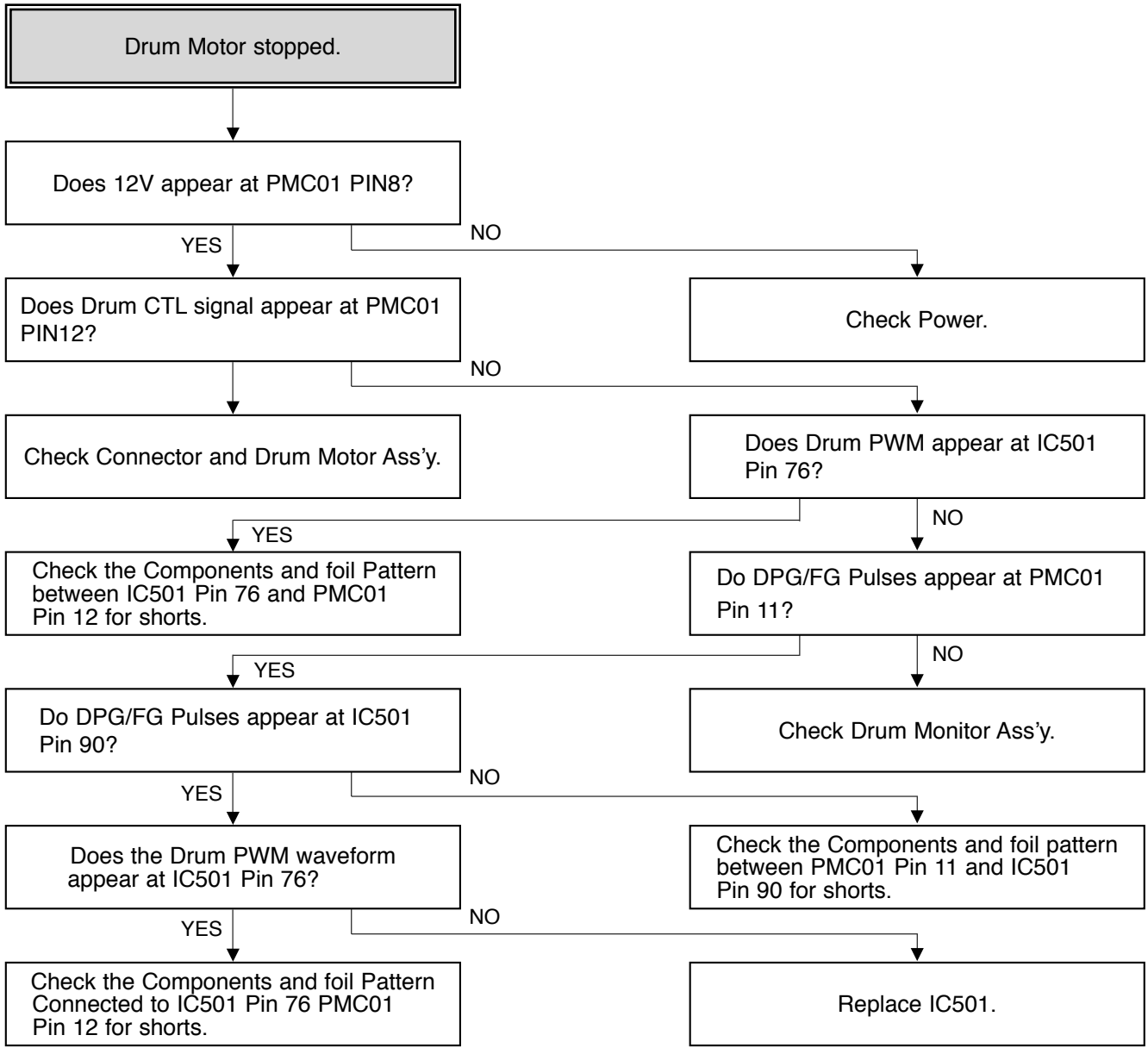

No 5V.
YES
Is 5.3VA put into the Q155(Q157) collector?
YES
Is the Q156 Base “H”?
NO
Check the μ-com Control.
YES
Is about 4.7V put into the Q155(Q157) Base?
NO
Check the Q156 whether it works normally.
YES
Check or Replace the Q155(Q157).

2. Servo Circuit

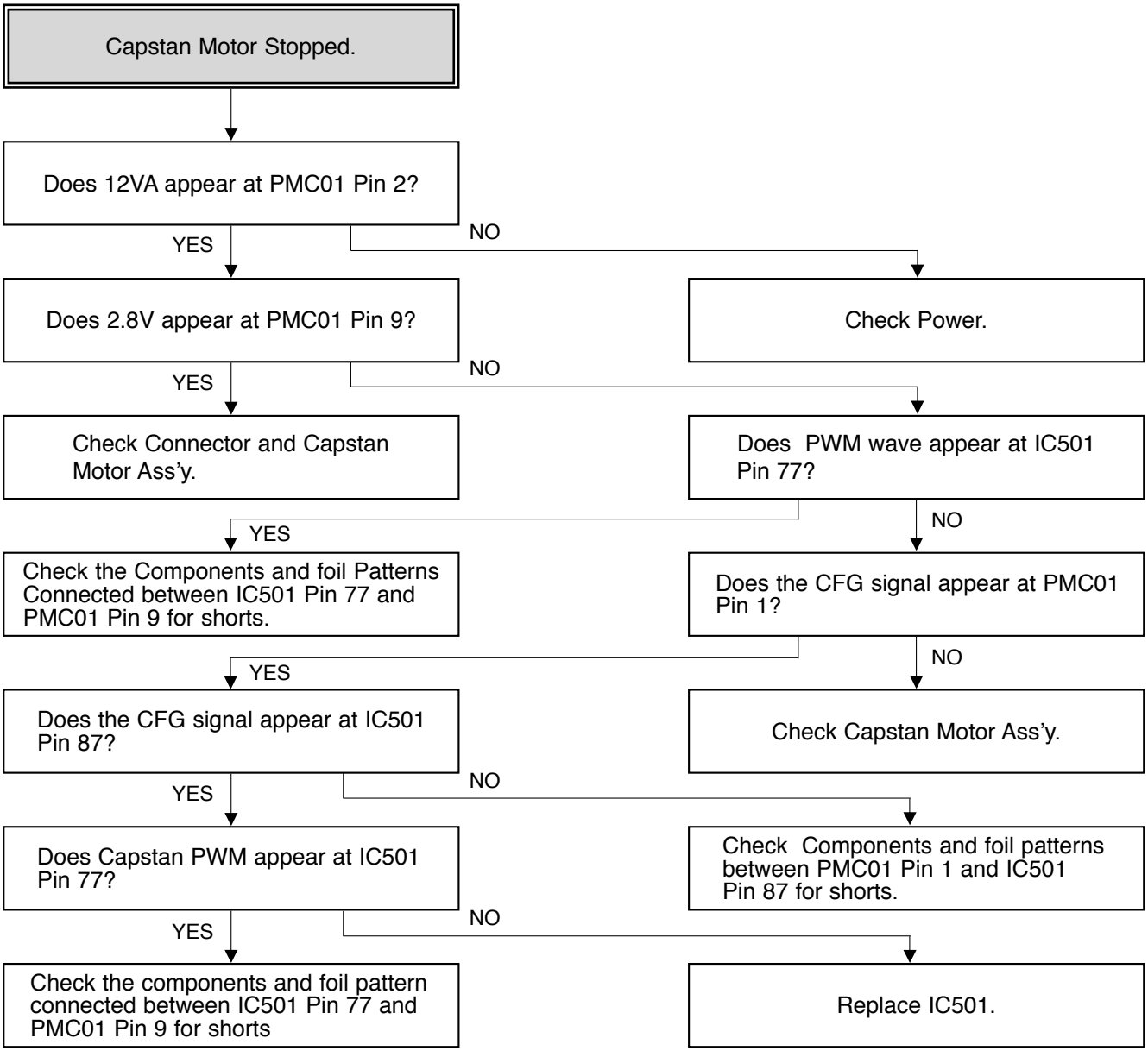
A.


Unstable Video in PB Mode.
Does the on screen noise level change periodically?
YES
Do CTL pulses appear at IC501 pin 97?
NO
YES
Does the CFG divide waveform appear at IC501 pin 87?
Is the height of the CTL Head adjusted correctly?
NO
YES
Adjust the CTL Head.
Do the CTL pulses move when TRK is operated?
NO
YES
Does the Video Envelope waveform appear at IC501 Pin 9?
Replace IC501.
NO
YES
Replace IC501.
Check Y/C Block.

B.

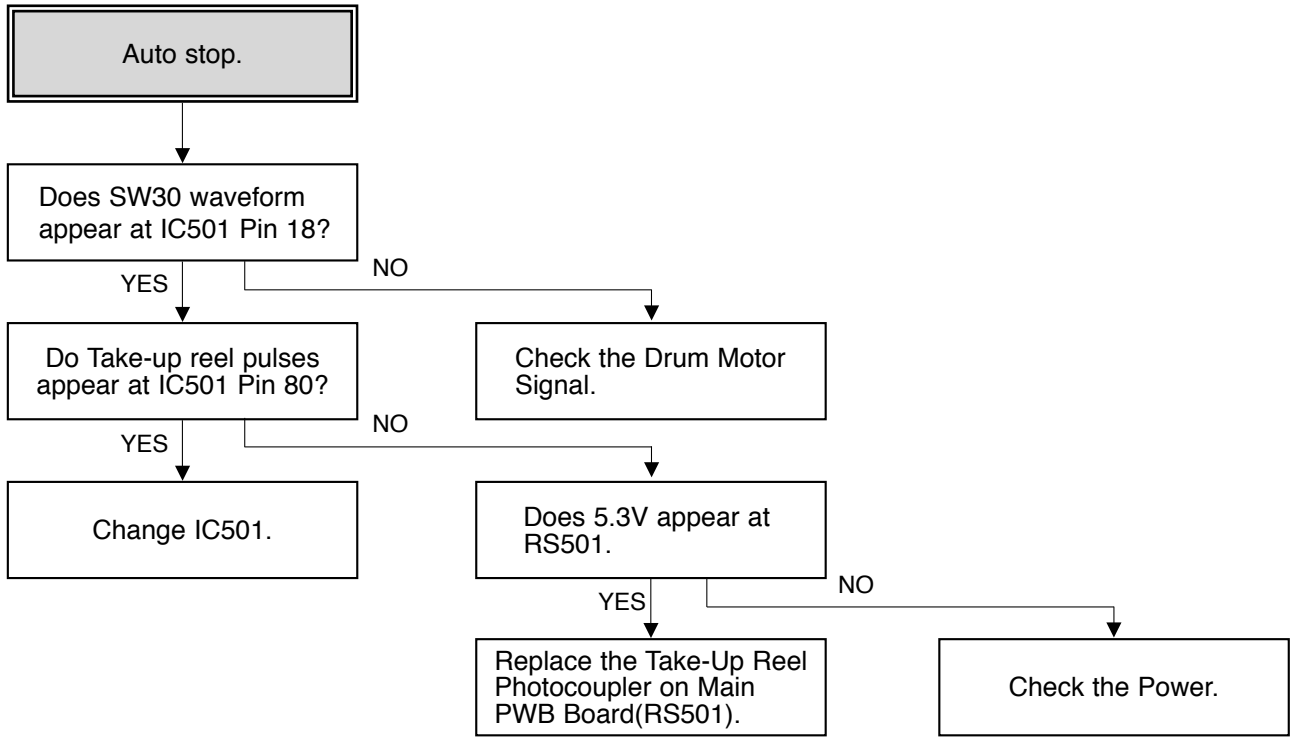

Drum Motor stopped.
Does 12V appear at PMC01 PIN8?
NO
YES
Check Power.
Does Drum CTL signal appear at PMC01 PIN12?
NO
Check Connector and Drum Motor Ass'y.
Does Drum PWM appear at IC501 Pin 76?
NO
YES
Check the Components and foil Pattern between IC501 Pin 76 and PMC01 Pin 12 for shorts.
Do DPG/FG Pulses appear at PMC01 Pin 11?
NO
YES
Do DPG/FG Pulses appear at IC501 Pin 90?
Check Drum Monitor Ass'y.
NO
YES
Does the Drum PWM waveform appear at IC501 Pin 76?
Check the Components and foil pattern between PMC01 Pin 11 and IC501 Pin 90 for shorts.
NO
YES
Check the Components and foil Pattern Connected to IC501 Pin 76 PMC01 Pin 12 for shorts.
Replace IC501.

C.

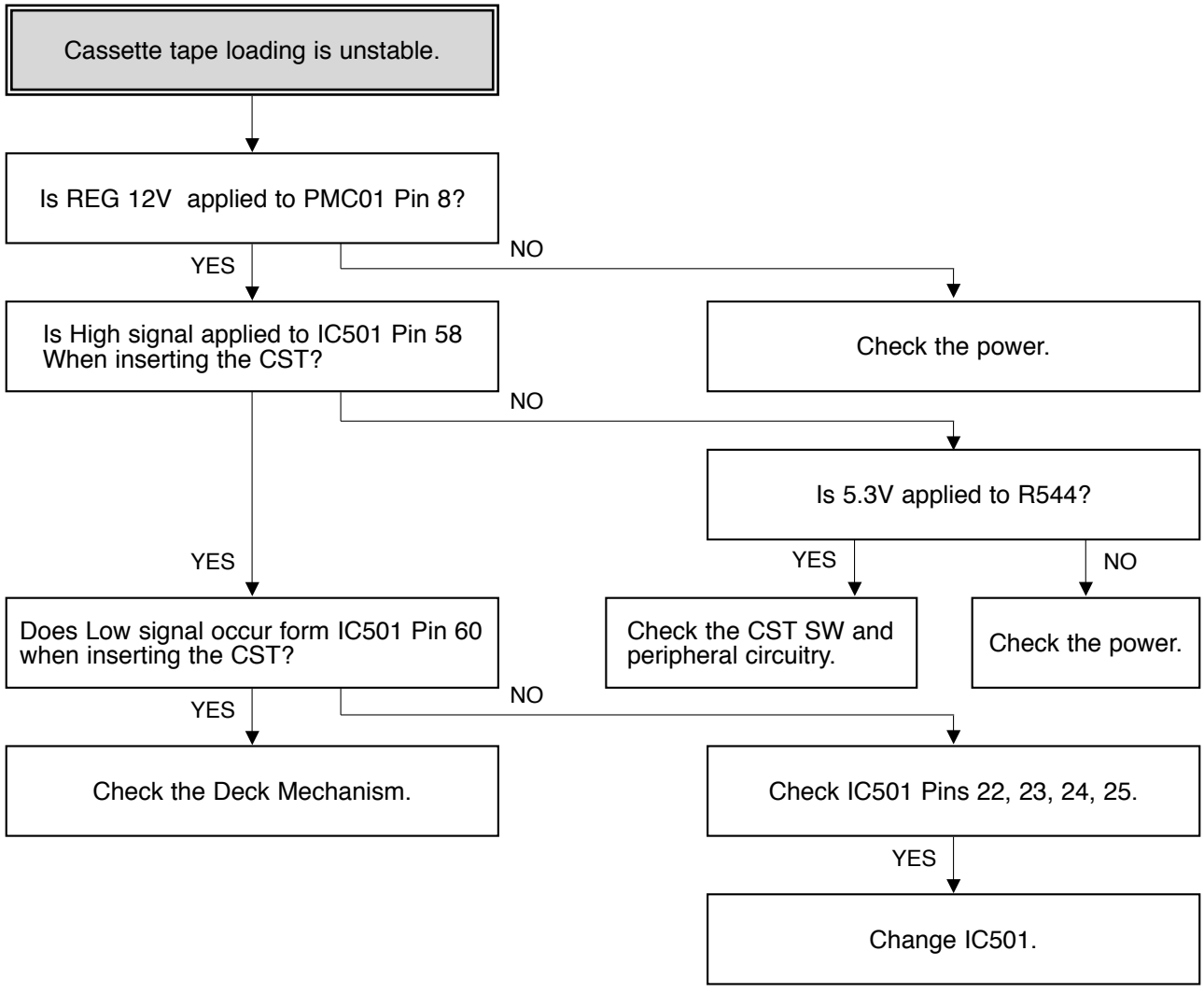

Capstan Motor Stopped.
Does 12VA appear at PMC01 Pin 2?
YES
NO
Check Power.
Does 2.8V appear at PMC01 Pin 9?
YES
NO
Check Connector and Capstan Motor Ass'y.
Does PWM wave appear at IC501 Pin 77?
YES
NO
Check the Components and foil Patterns Connected between IC501 Pin 77 and PMC01 Pin 9 for shorts.
Does the CFG signal appear at PMC01 Pin 1?
YES
NO
Does the CFG signal appear at IC501 Pin 87?
Check Capstan Motor Ass'y.
YES
NO
Does Capstan PWM appear at IC501 Pin 77?
Check Components and foil patterns between PMC01 Pin 1 and IC501 Pin 87 for shorts.
YES
NO
Check the components and foil pattern connected between IC501 Pin 77 and PMC01 Pin 9 for shorts
Replace IC501.

3. System & Front Panel Circuit

A.

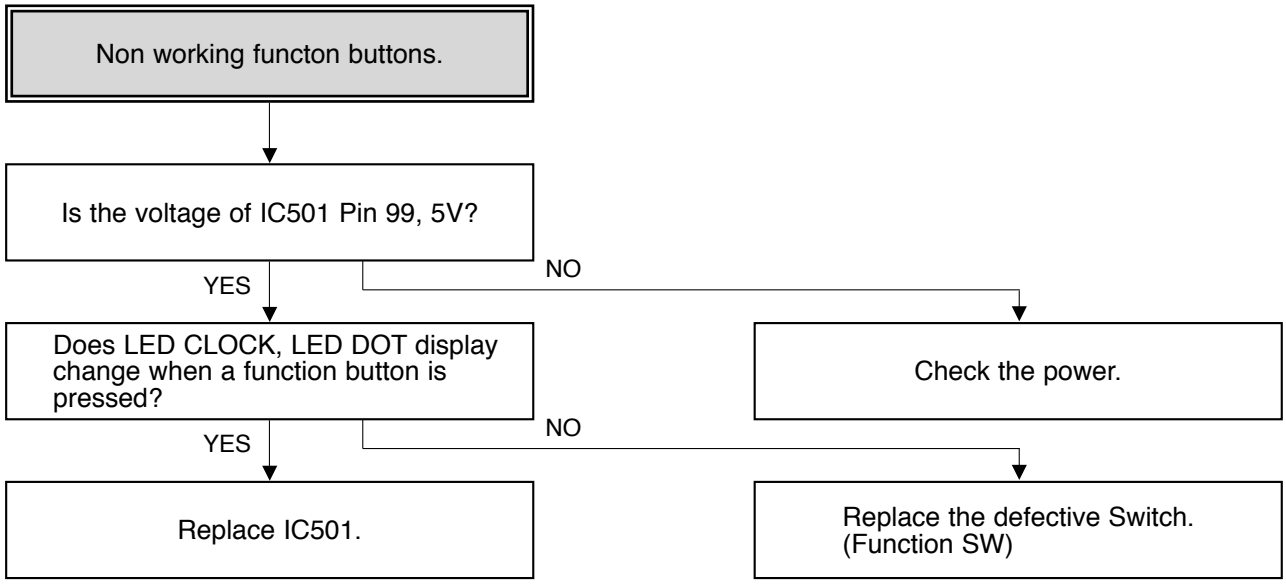


B.

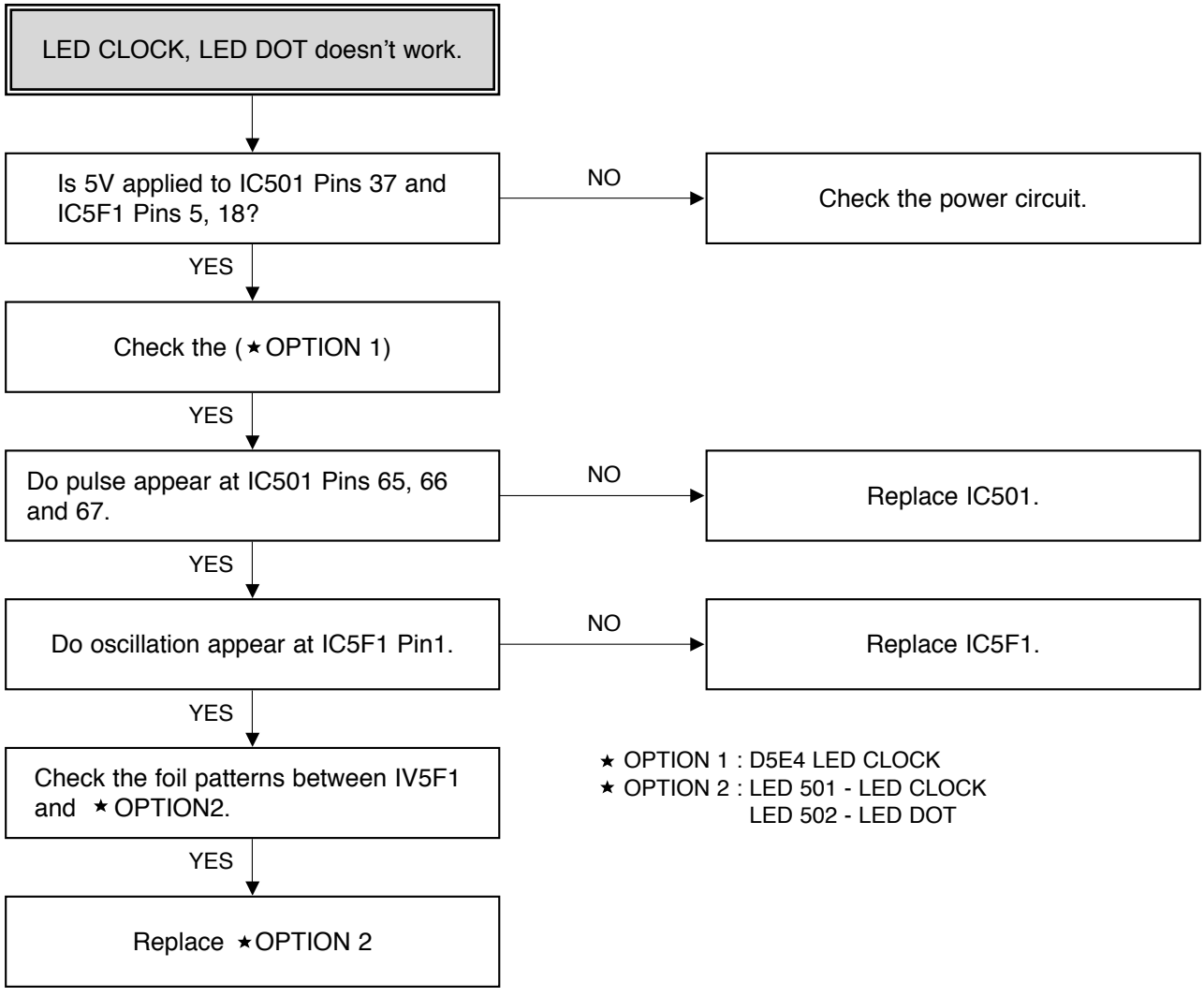


NOTE : Auto stop may also be caused by lack of lubrication,due to dried grease or oil.

C.


Non working functon buttons.
Is the voltage of IC501 Pin 99, 5V?
YES
NO
Check the power.
Does LED CLOCK, LED DOT display change when a function button is pressed?
YES
NO
Replace IC501.
Replace the defective Switch. (Function SW)

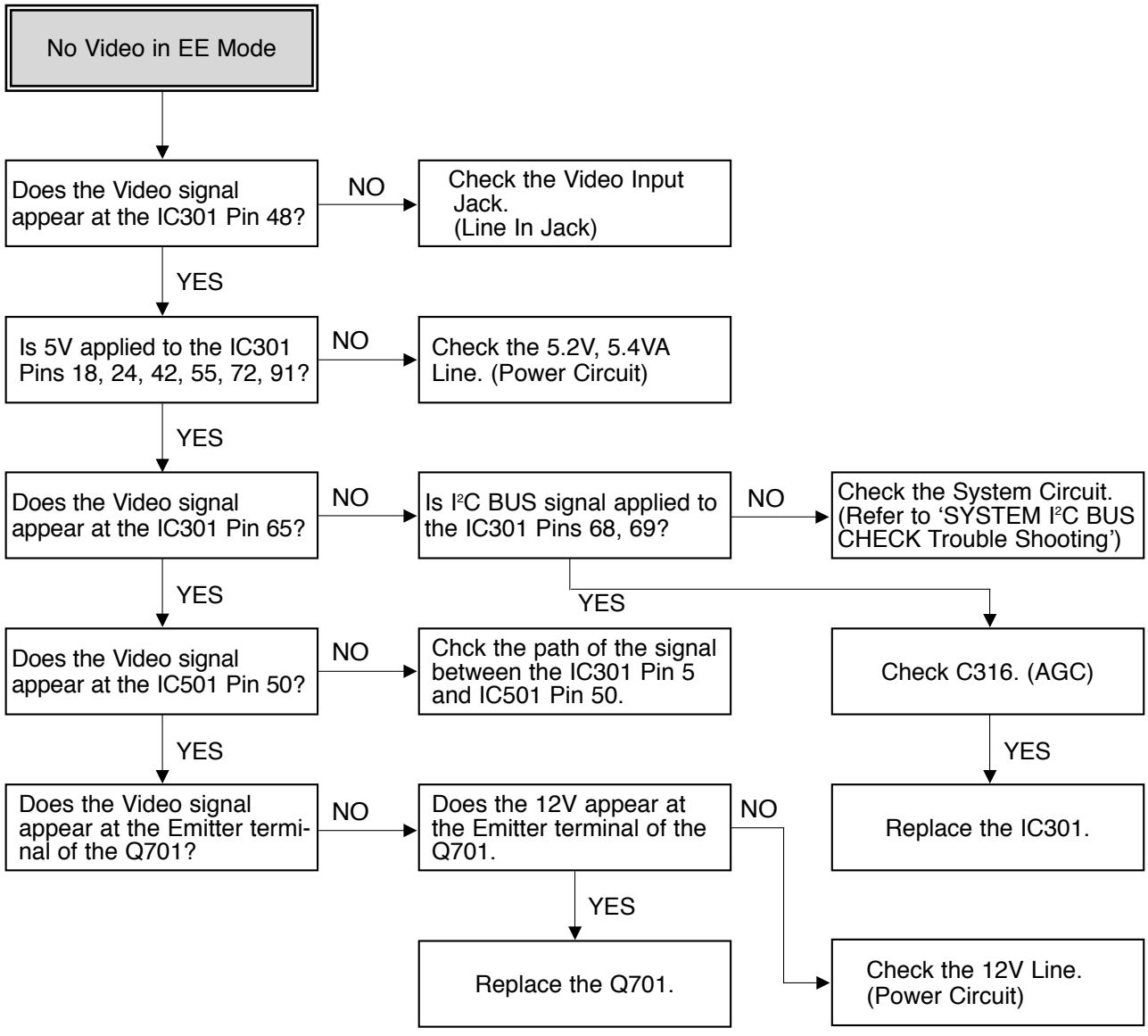
D.



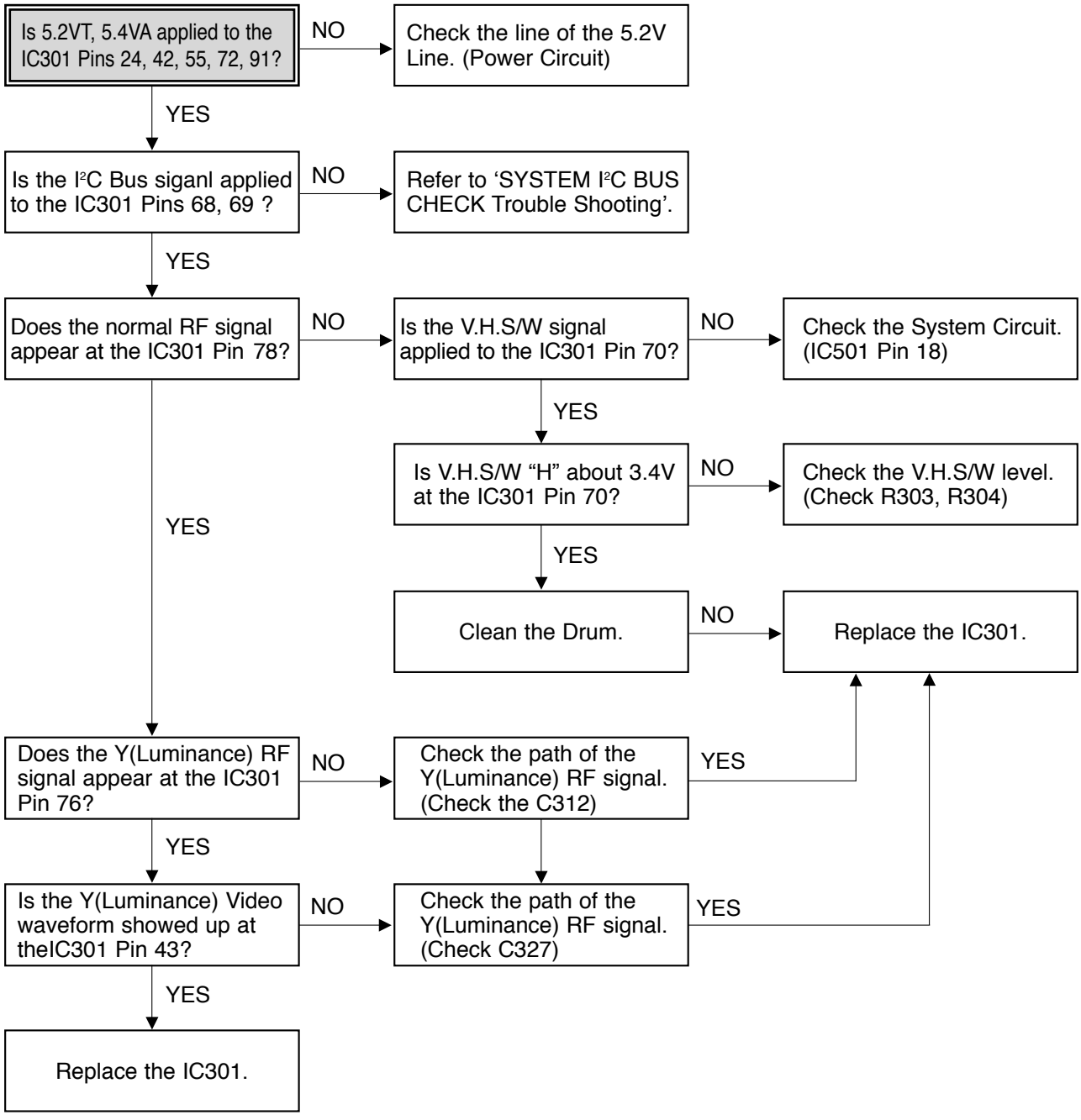
★ OPTION 1 : D5E4 LED CLOCK
★ OPTION 2 : LED 501 - LED CLOCK
LED 502 - LED DOT

4. Y/C CIRCUIT

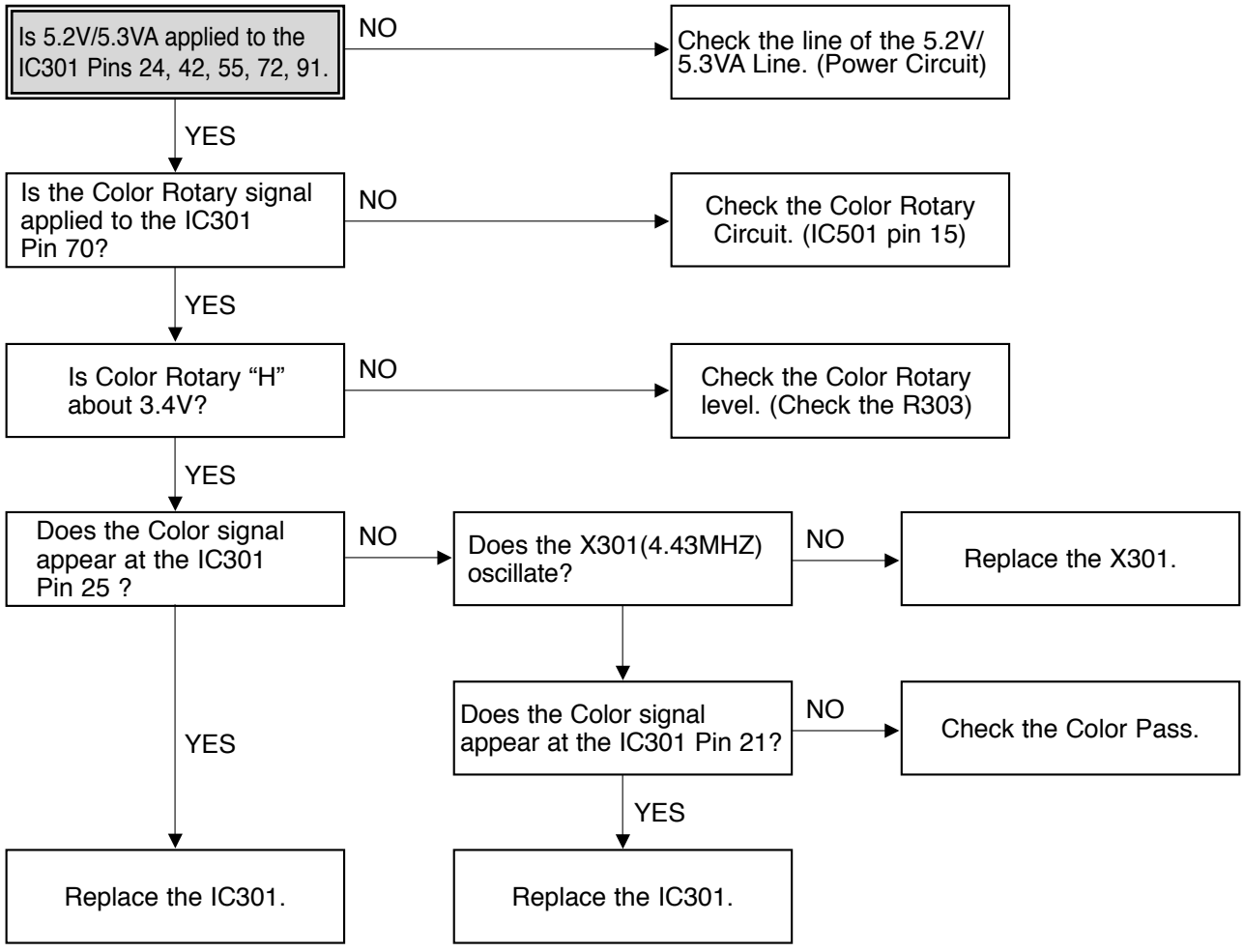
(1) No Video in EE Mode,


No Video in EE Mode
Does the Video signal appear at the IC301 Pin 48?
NO
Check the Video Input Jack. (Line In Jack)
YES
Is 5V applied to the IC301 Pins 18, 24, 42, 55, 72, 91?
NO
Check the 5.2V, 5.4VA Line. (Power Circuit)
YES
Does the Video signal appear at the IC301 Pin 65?
NO
Is I²C BUS signal applied to the IC301 Pins 68, 69?
NO
Check the System Circuit. (Refer to 'SYSTEM I²C BUS CHECK Trouble Shooting')
YES
YES
Does the Video signal appear at the IC501 Pin 50?
NO
Chck the path of the signal between the IC301 Pin 5 and IC501 Pin 50.
Check C316. (AGC)
YES
YES
Does the Video signal appear at the Emitter terminal of the Q701?
NO
Does the 12V appear at the Emitter terminal of the Q701.
NO
Replace the IC301.
YES
Replace the Q701.
Check the 12V Line. (Power Circuit)

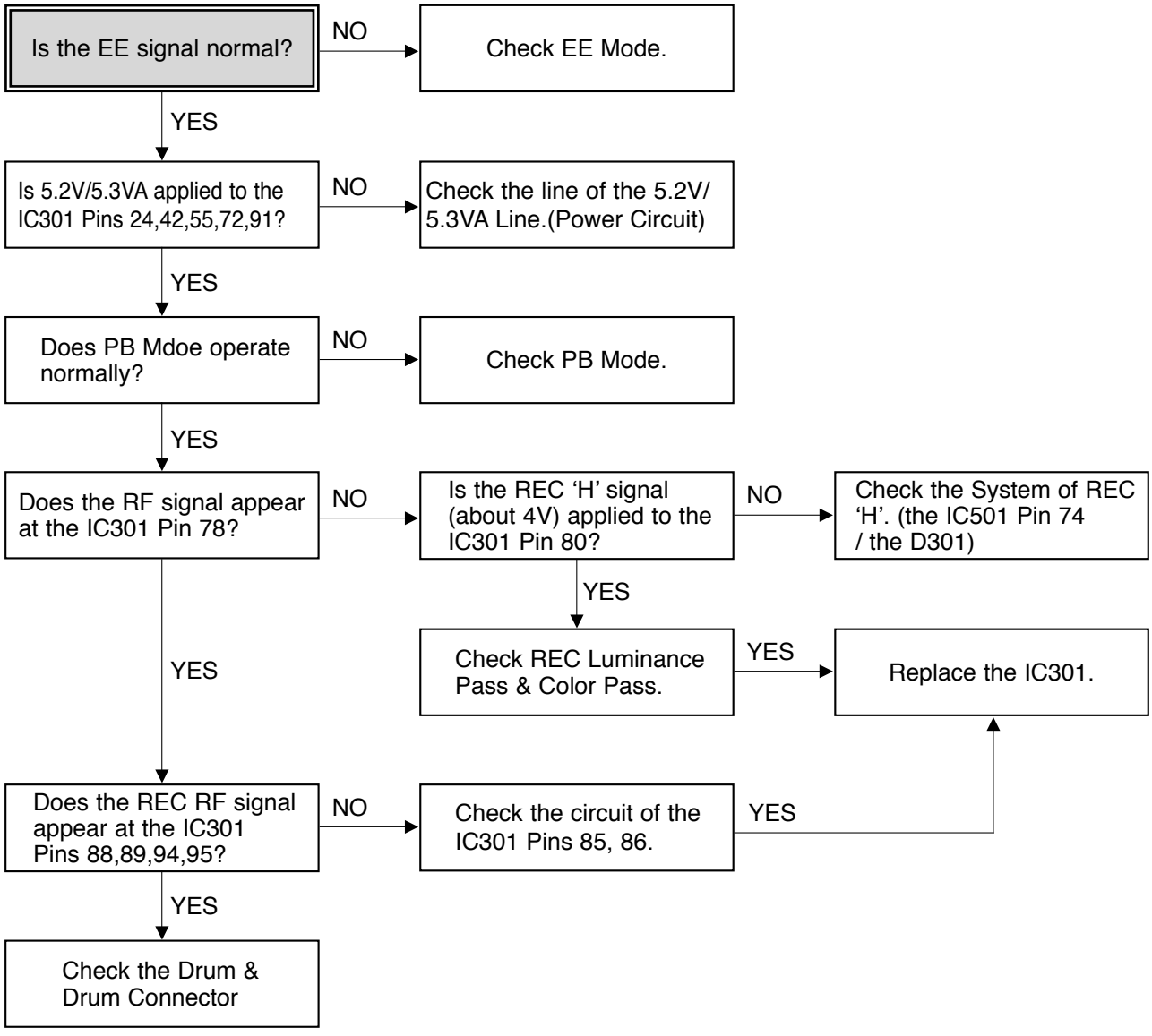
(2) When the Y(Luminance) signal doesn't appear on the screen in PB Mode,


Is 5.2VT, 5.4VA applied to the IC301 Pins 24, 42, 55, 72, 91?
NO
Check the line of the 5.2V Line. (Power Circuit)
YES
Is the I²C Bus siganl applied to the IC301 Pins 68, 69 ?
NO
Refer to 'SYSTEM I²C BUS CHECK Trouble Shooting'.
YES
Does the normal RF signal appear at the IC301 Pin 78?
NO
Is the V.H.S/W signal applied to the IC301 Pin 70?
NO
Check the System Circuit. (IC501 Pin 18)
YES
Is V.H.S/W "H" about 3.4V at the IC301 Pin 70?
NO
Check the V.H.S/W level. (Check R303, R304)
YES
YES
Clean the Drum.
NO
Replace the IC301.
Does the Y(Luminance) RF signal appear at the IC301 Pin 76?
NO
Check the path of the Y(Luminance) RF signal. (Check the C312)
YES
YES
Is the Y(Luminance) Video waveform showed up at theIC301 Pin 43?
NO
Check the path of the Y(Luminance) RF signal. (Check C327)
YES
YES
Replace the IC301.

(3) When the C(Color) signal doesn't appear on the screen in PB Mode,

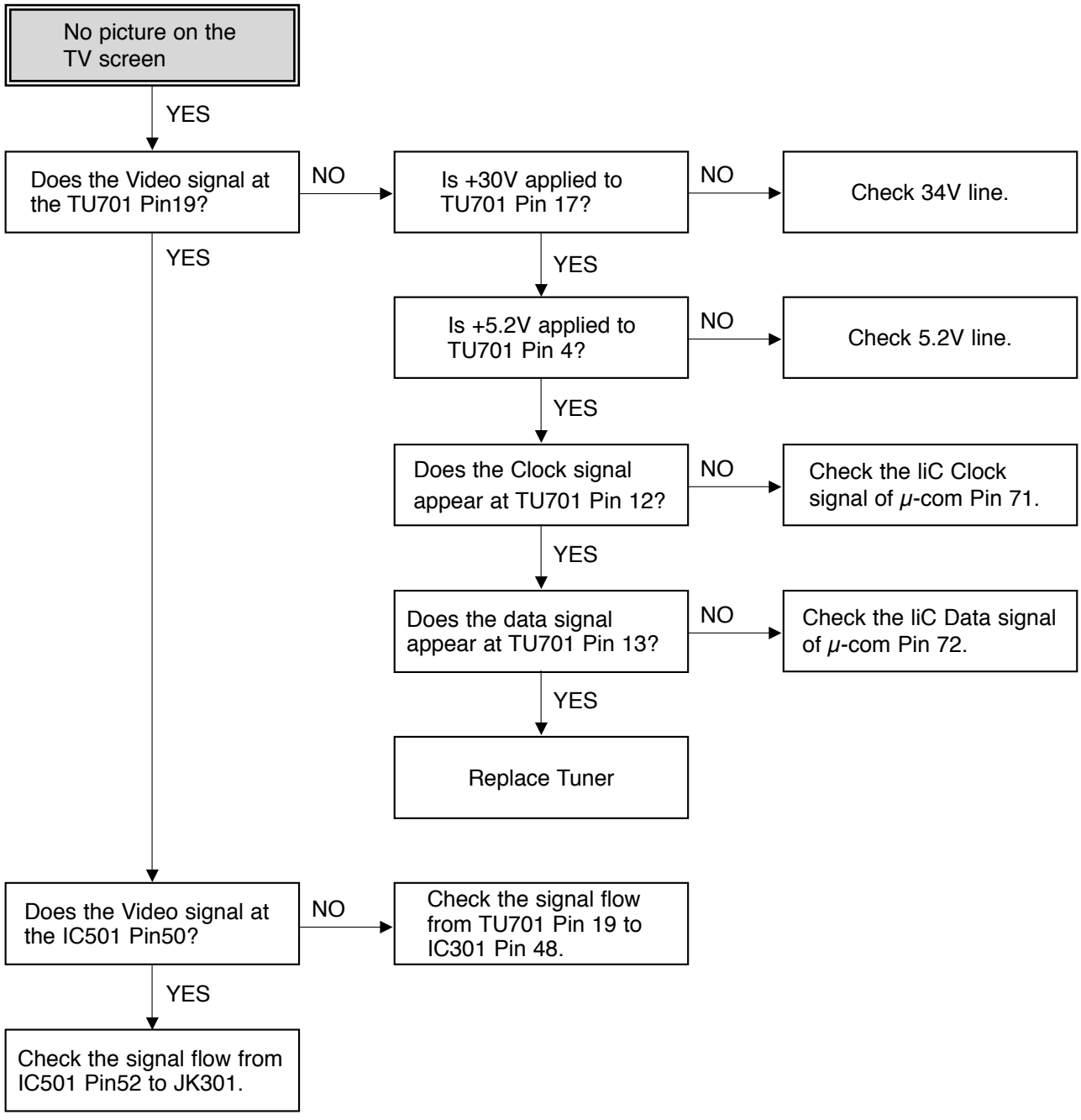

Is 5.2V/5.3VA applied to the IC301 Pins 24, 42, 55, 72, 91.
NO
Check the line of the 5.2V/ 5.3VA Line. (Power Circuit)
YES
Is the Color Rotary signal applied to the IC301 Pin 70?
NO
Check the Color Rotary Circuit. (IC501 pin 15)
YES
Is Color Rotary "H" about 3.4V?
NO
Check the Color Rotary level. (Check the R303)
YES
Does the Color signal appear at the IC301 Pin 25 ?
NO
Does the X301(4.43MHZ) oscillate?
NO
Replace the X301.
YES
Does the Color signal appear at the IC301 Pin 21?
NO
Check the Color Pass.
YES
Replace the IC301.
Replace the IC301.

(4) When the Video signal doesn't appear on the screen in REC Mode,

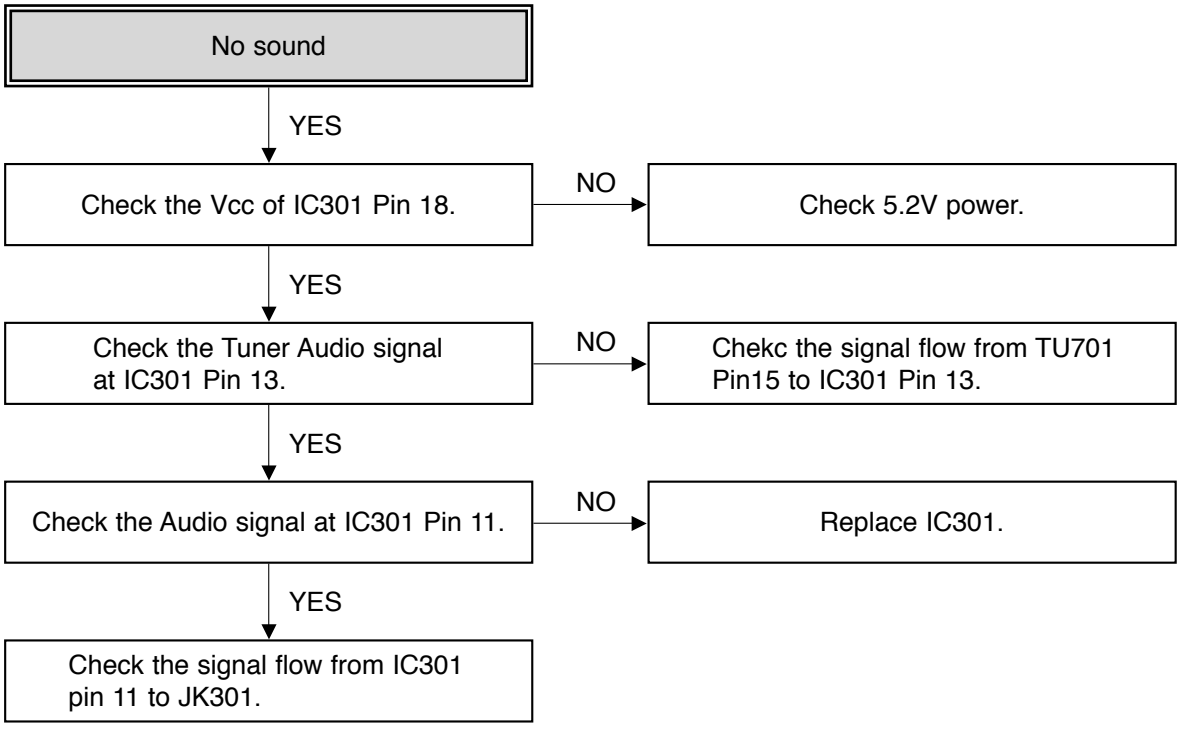

Is the EE signal normal?
NO
Check EE Mode.
YES
Is 5.2V/5.3VA applied to the IC301 Pins 24,42,55,72,91?
NO
Check the line of the 5.2V/ 5.3VA Line.(Power Circuit)
YES
Does PB Mdoe operate normally?
NO
Check PB Mode.
YES
Does the RF signal appear at the IC301 Pin 78?
NO
Is the REC 'H' signal (about 4V) applied to the IC301 Pin 80?
NO
Check the System of REC 'H'. (the IC501 Pin 74 / the D301)
YES
Check REC Luminance Pass & Color Pass.
YES
Replace the IC301.
YES
Does the REC RF signal appear at the IC301 Pins 88,89,94,95?
NO
Check the circuit of the IC301 Pins 85, 86.
YES
YES
Check the Drum & Drum Connector

5. Tuner/IF circuit

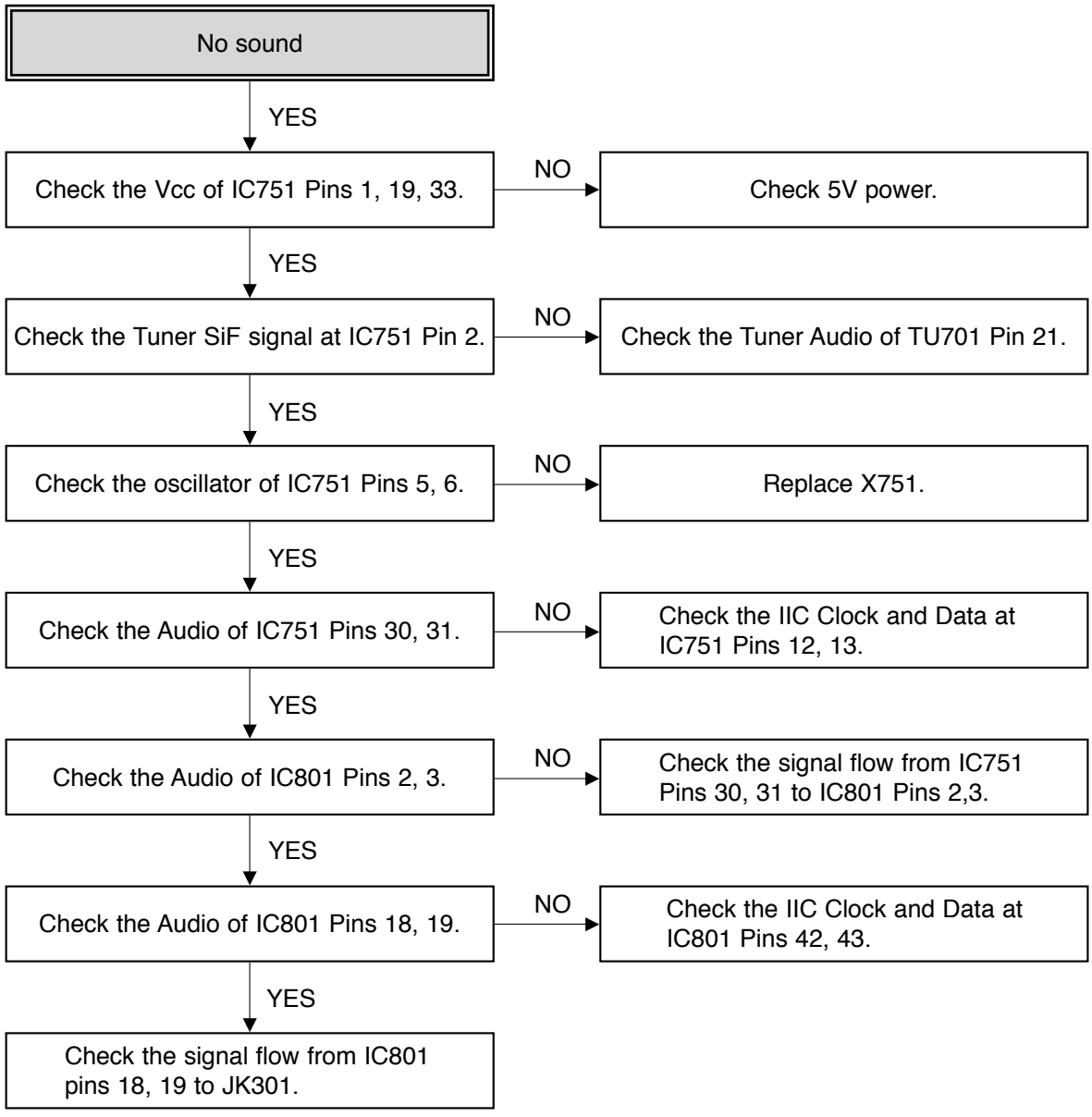
(1) No picture on the TV screen


No picture on the TV screen
YES
Does the Video signal at the TU701 Pin19?
NO
Is +30V applied to TU701 Pin 17?
NO
Check 34V line.
YES
Is +5.2V applied to TU701 Pin 4?
NO
Check 5.2V line.
YES
Does the Clock signal appear at TU701 Pin 12?
NO
Check the IiC Clock signal of μ-com Pin 71.
YES
Does the data signal appear at TU701 Pin 13?
NO
Check the IiC Data signal of μ-com Pin 72.
YES
Replace Tuner
YES
Does the Video signal at the IC501 Pin50?
NO
Check the signal flow from TU701 Pin 19 to IC301 Pin 48.
YES
Check the signal flow from IC501 Pin52 to JK301.

(2) No sound (Mono Model)

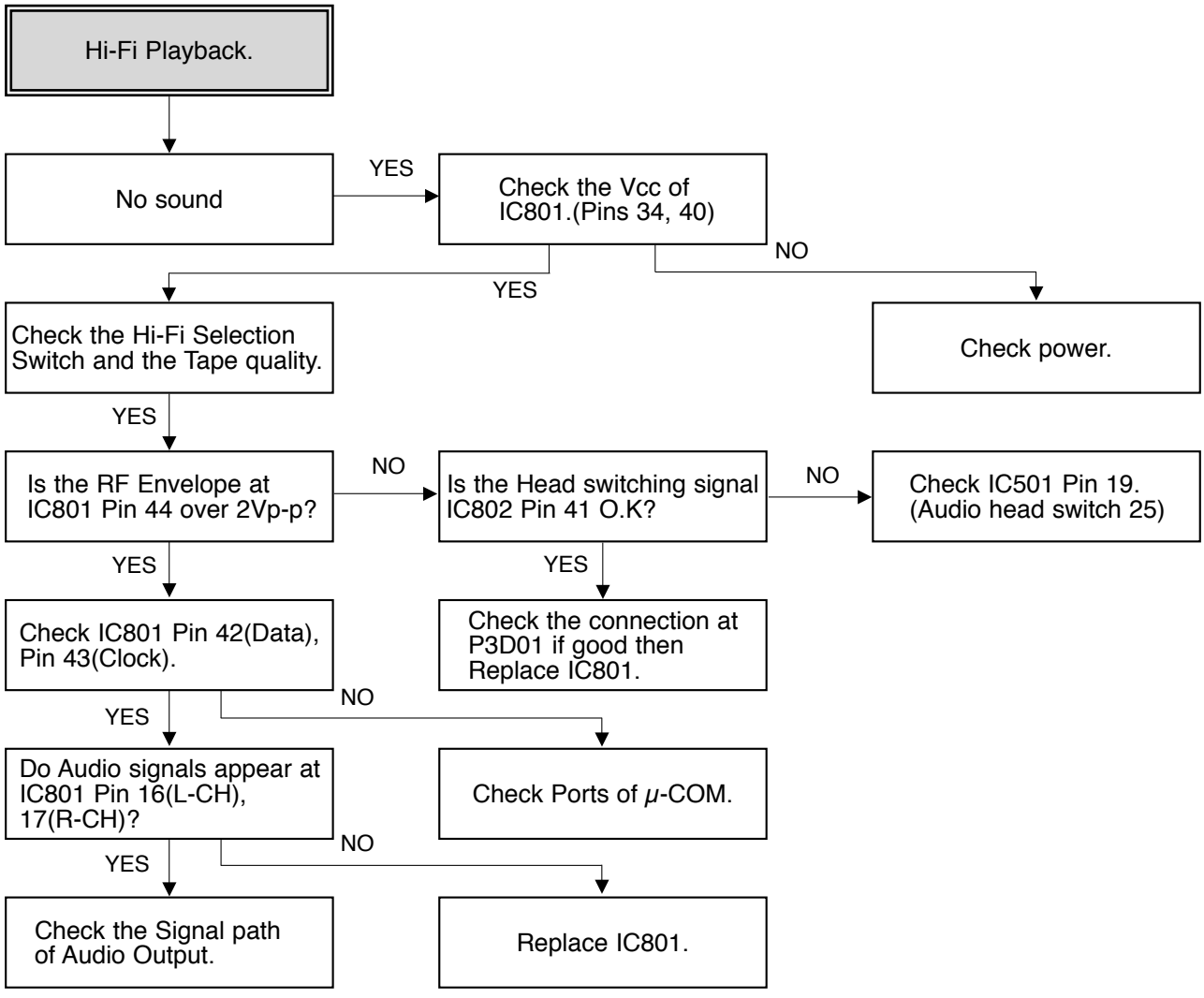


(3) No sound (Hi-Fi Model)

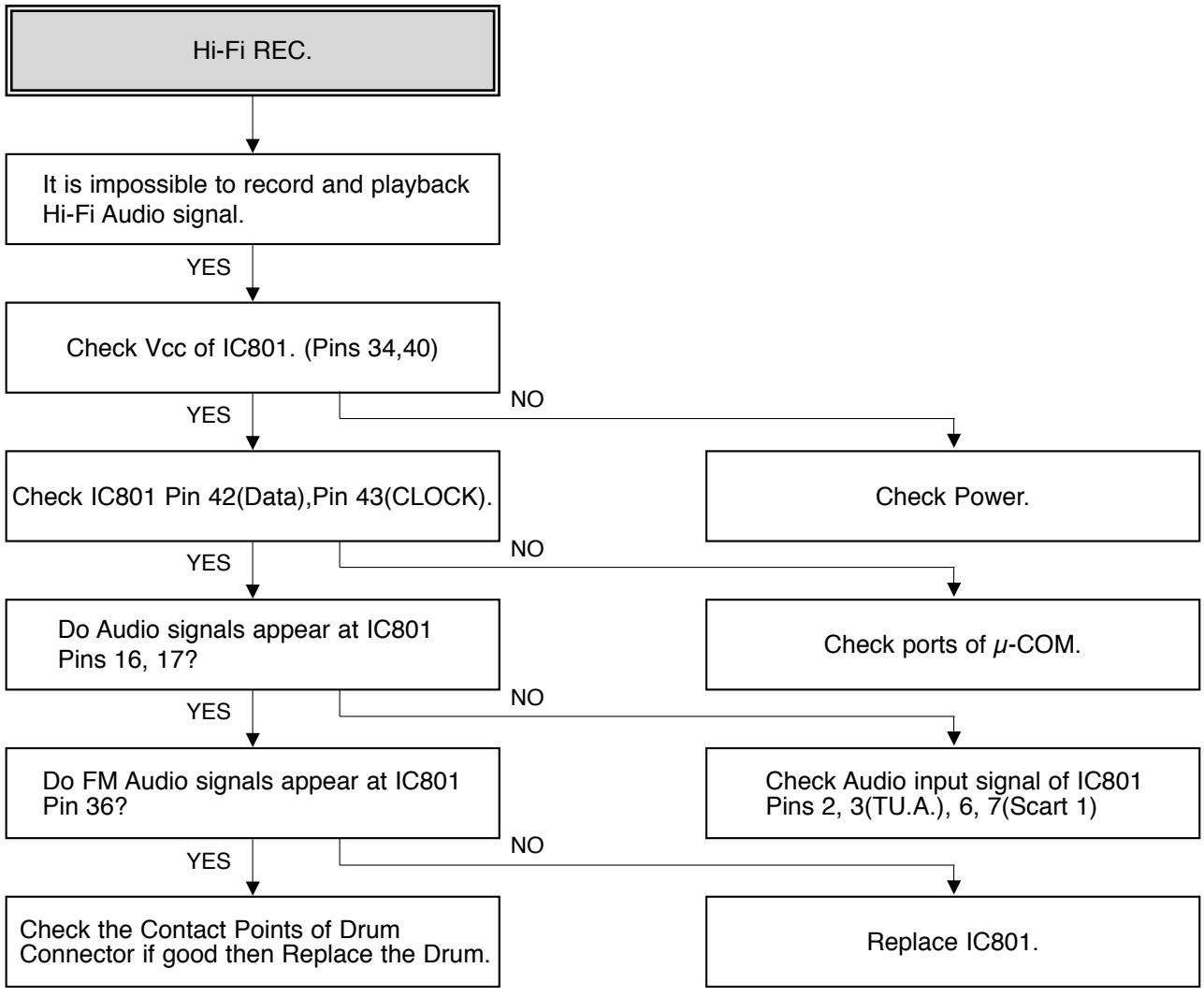

No sound
YES
Check the Vcc of IC751 Pins 1, 19, 33.
NO
Check 5V power.
YES
Check the Tuner SiF signal at IC751 Pin 2.
NO
Check the Tuner Audio of TU701 Pin 21.
YES
Check the oscillator of IC751 Pins 5, 6.
NO
Replace X751.
YES
Check the Audio of IC751 Pins 30, 31.
NO
Check the IIC Clock and Data at IC751 Pins 12, 13.
YES
Check the Audio of IC801 Pins 2, 3.
NO
Check the signal flow from IC751 Pins 30, 31 to IC801 Pins 2,3.
YES
Check the Audio of IC801 Pins 18, 19.
NO
Check the IIC Clock and Data at IC801 Pins 42, 43.
YES
Check the signal flow from IC801 pins 18, 19 to JK301.

6. Hi-Fi Circuit (Hi-Fi Model)

A.

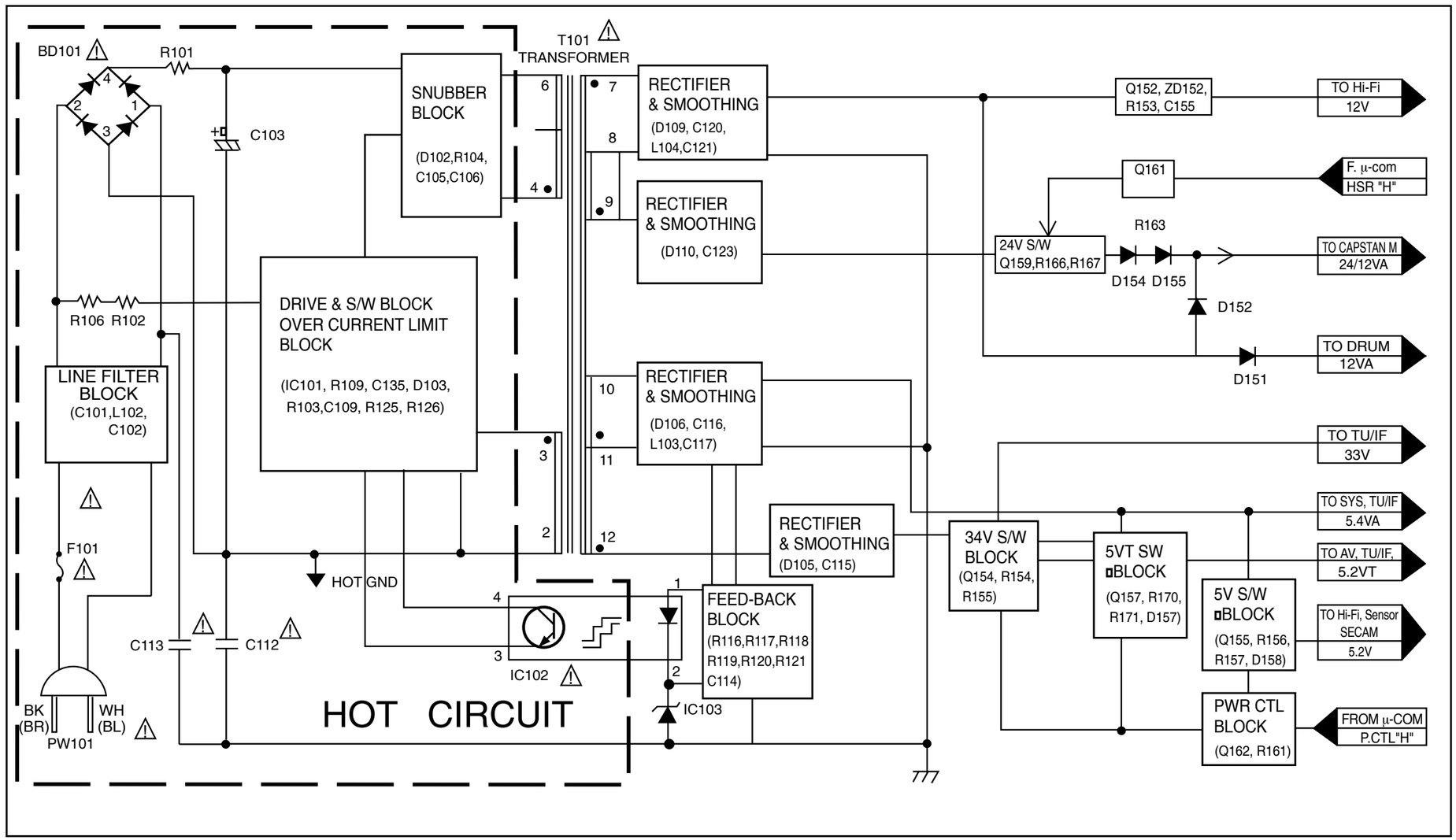


B.


Hi-Fi REC.
It is impossible to record and playback Hi-Fi Audio signal.
YES
Check Vcc of IC801. (Pins 34,40)
NO
YES
Check Power.
Check IC801 Pin 42(Data),Pin 43(CLOCK).
NO
YES
Check ports of μ-COM.
Do Audio signals appear at IC801 Pins 16, 17?
NO
YES
Check Audio input signal of IC801 Pins 2, 3(TU.A.), 6, 7(Scart 1)
Do FM Audio signals appear at IC801 Pin 36?
NO
YES
Replace IC801.
Check the Contact Points of Drum Connector if good then Replace the Drum.

BLOCK DIAGRAMS

1. Power Block Diagram

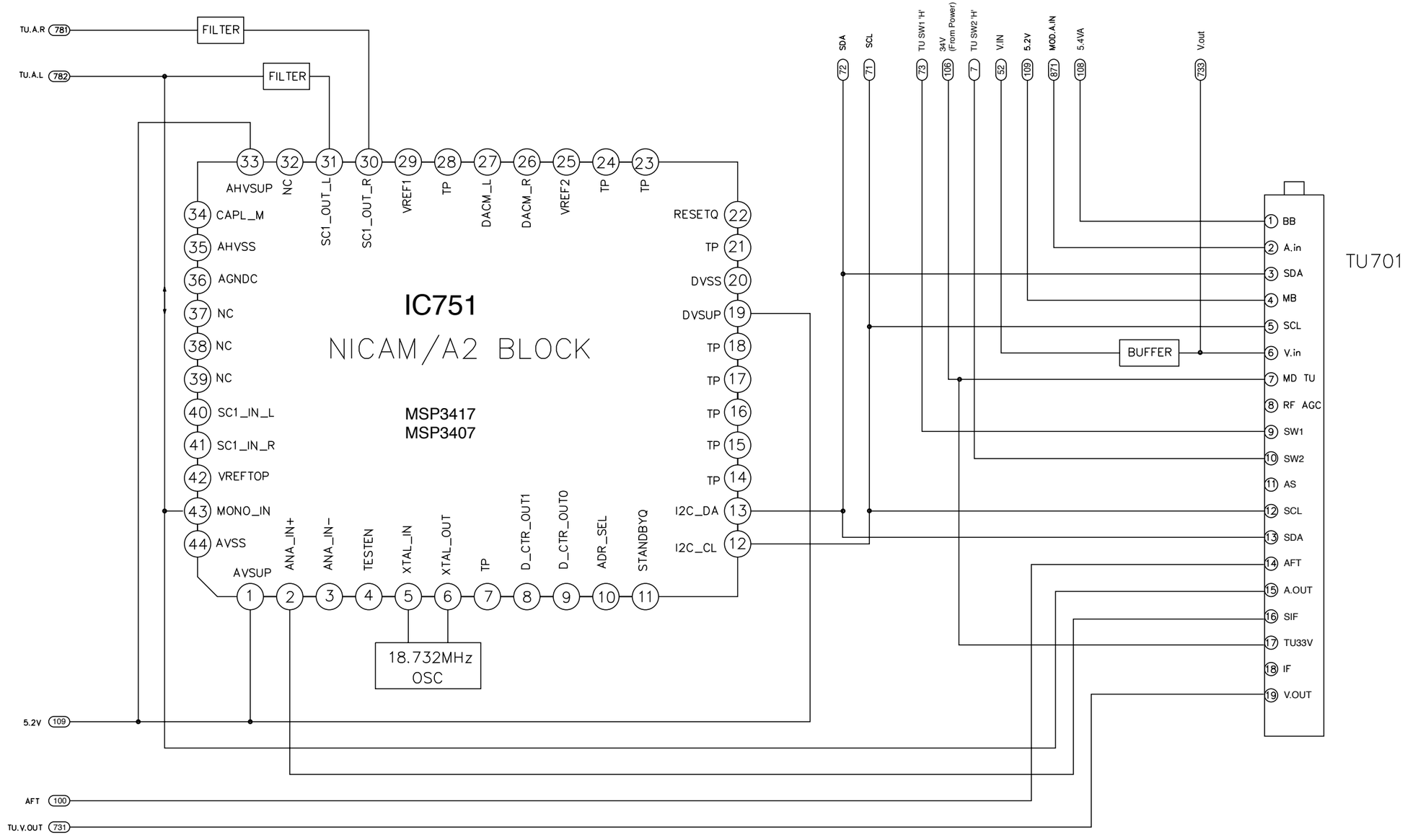


'00 11. 30

NOTES : Symbol denotes AC ground.

Symbol denotes DC chassis ground.

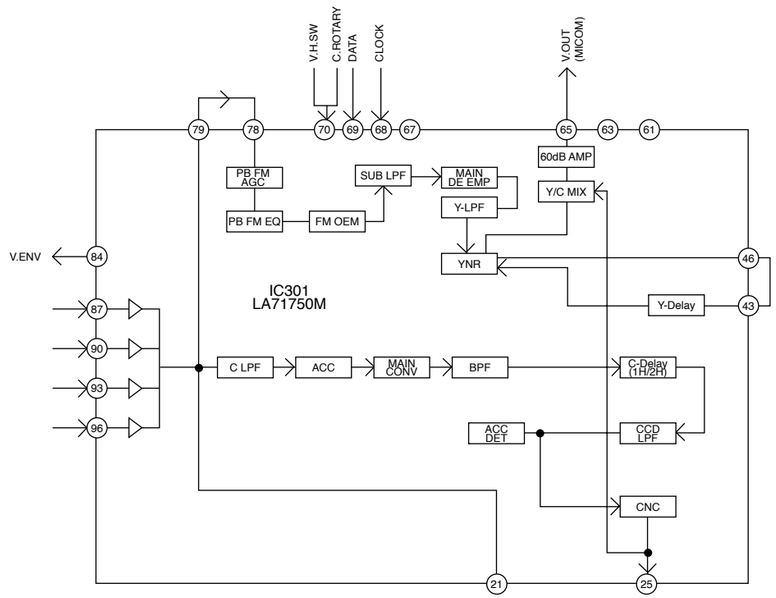
2. Tu/IF, NICAM & A2 Block Diagram



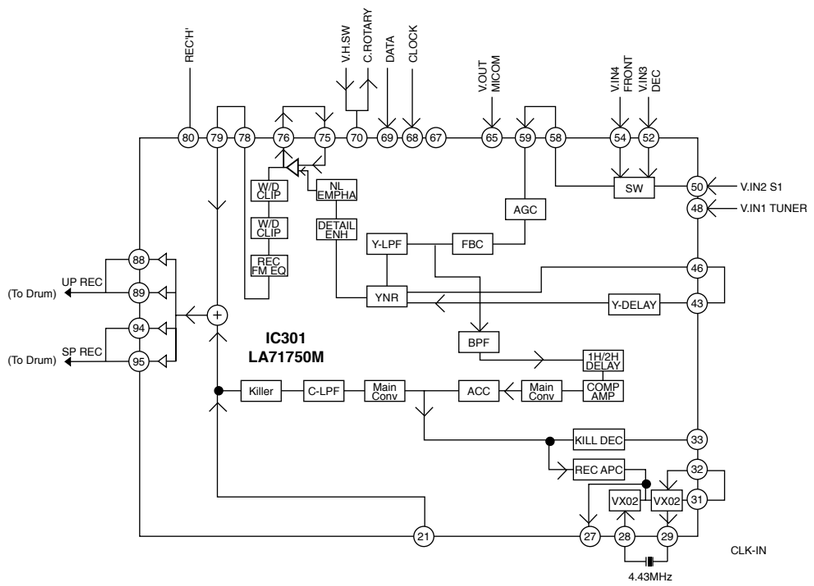
'04. 03. 03 R10488BA
BC999NS/BD289Y

3. Y/C Block Diagram

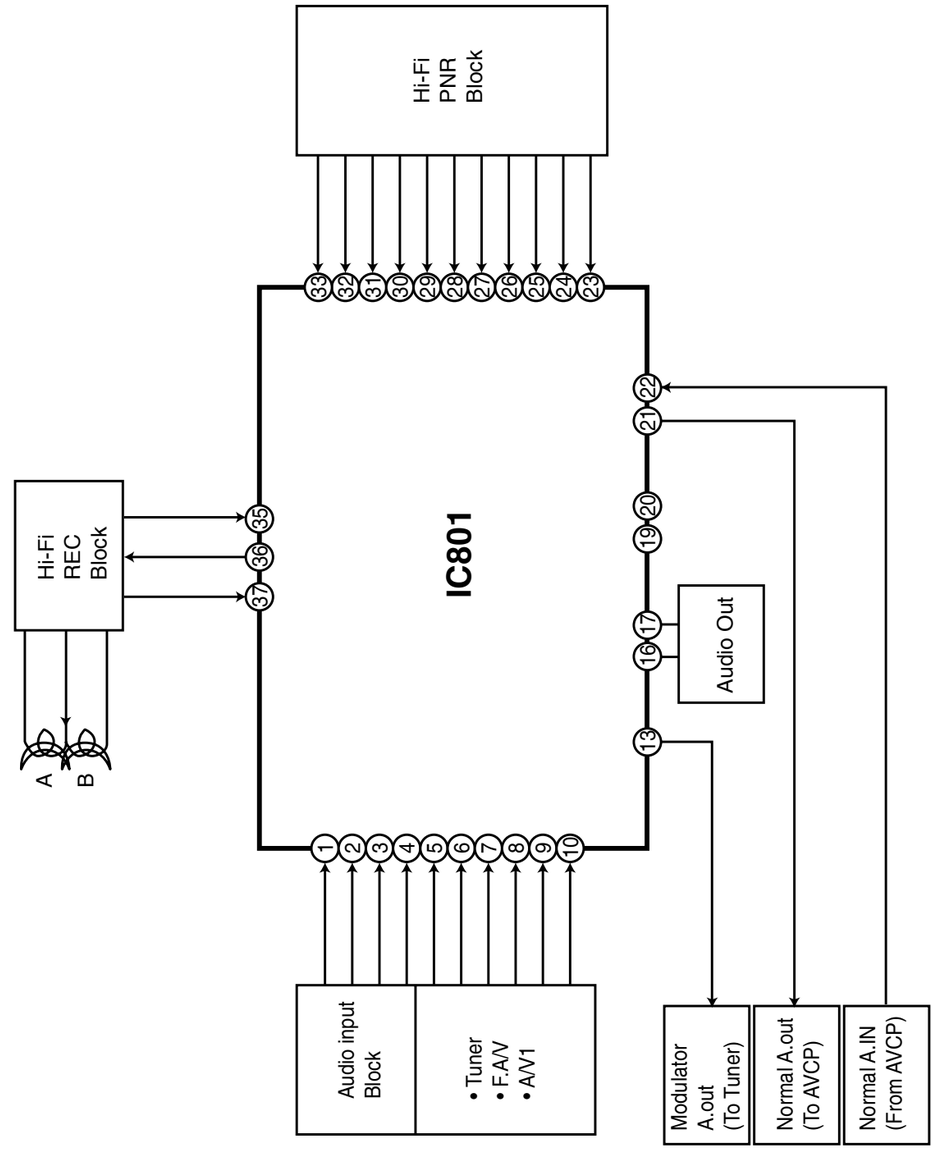
(PB MODE)



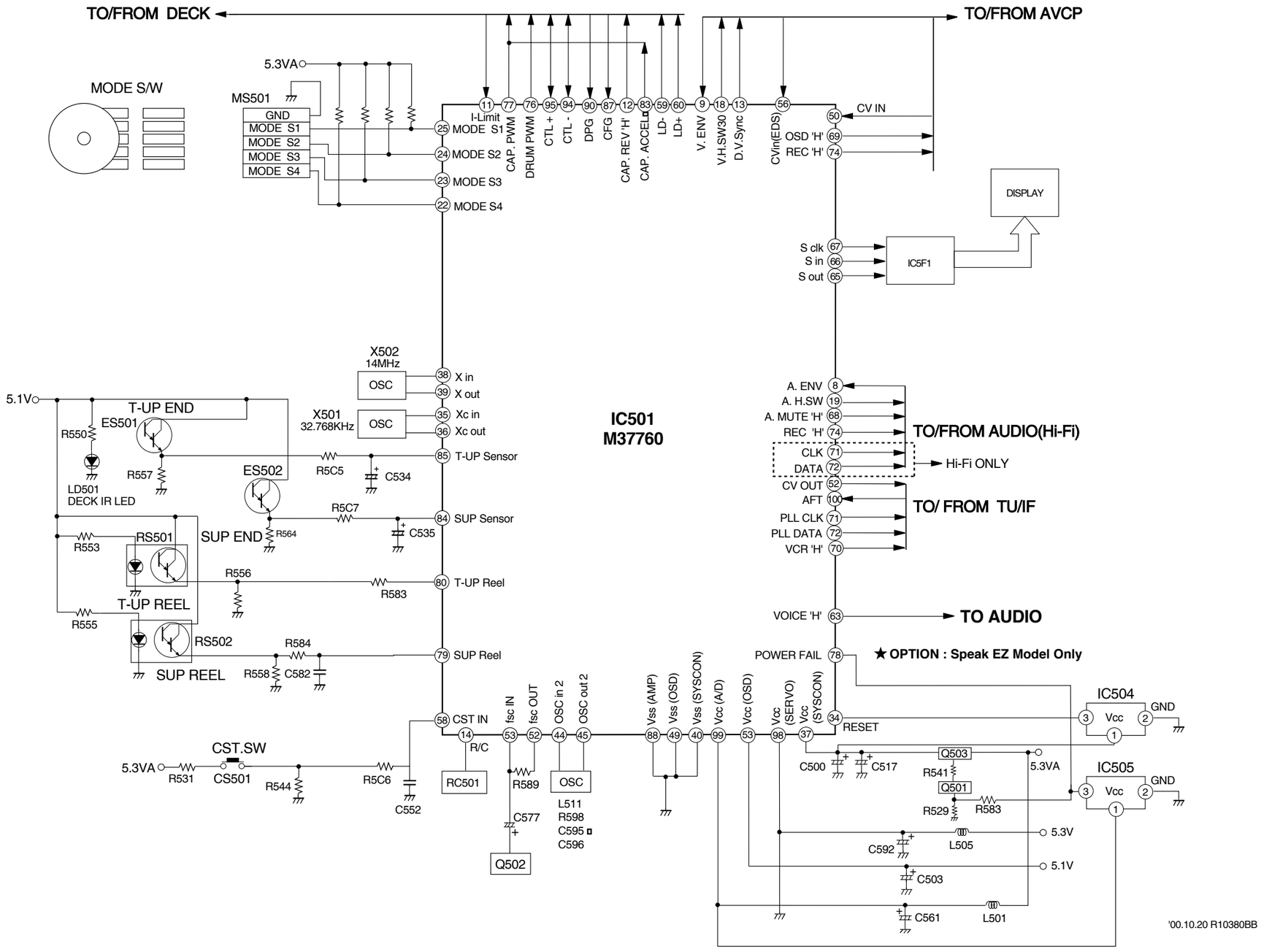
(REC MODE)



4. Hi-Fi Block Diagram

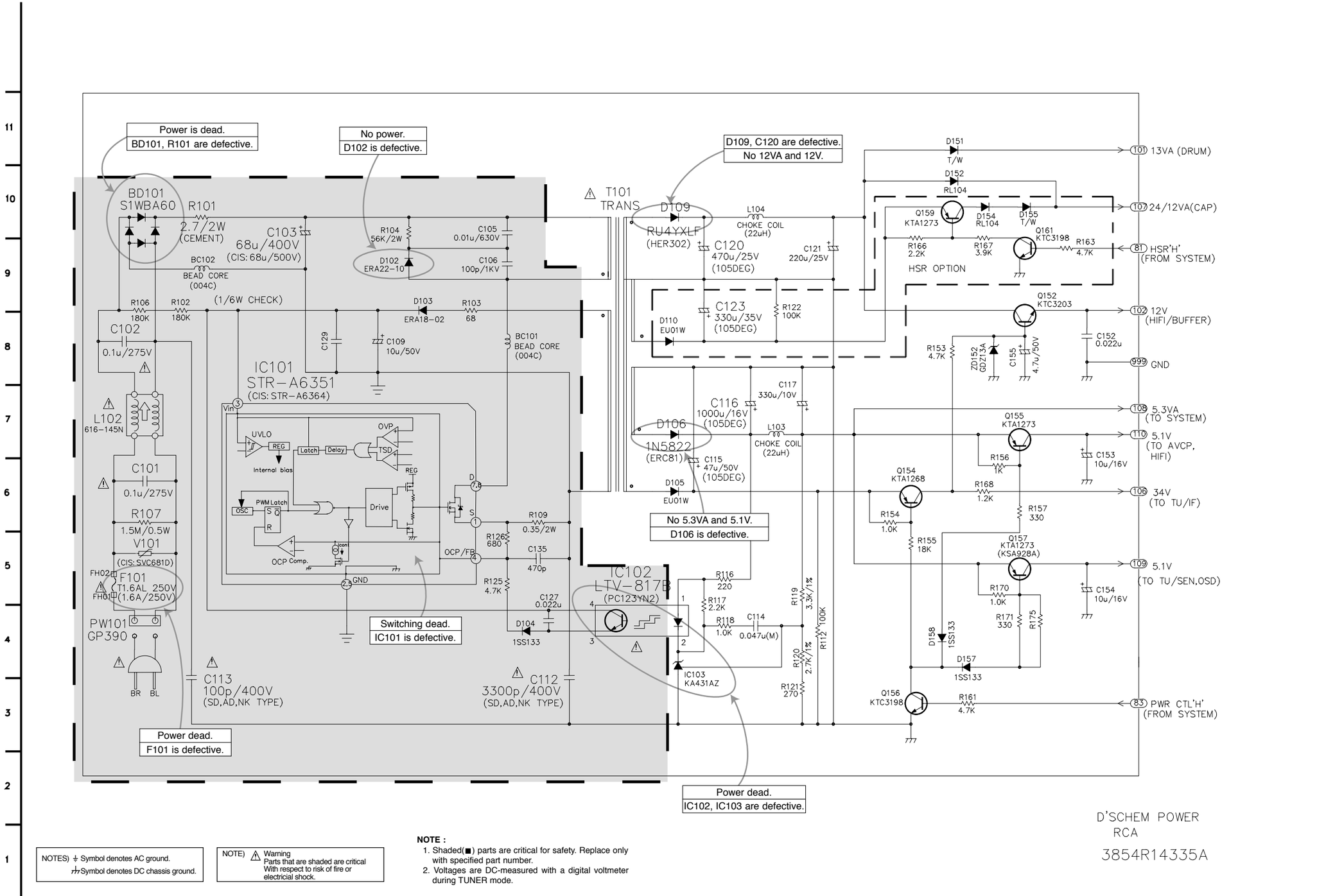


5. System Block Diagram



CIRCUIT DIAGRAMS

1. Power Circuit Diagram



NOTES) ⏚ Symbol denotes AC ground.
⏚ Symbol denotes DC chassis ground.

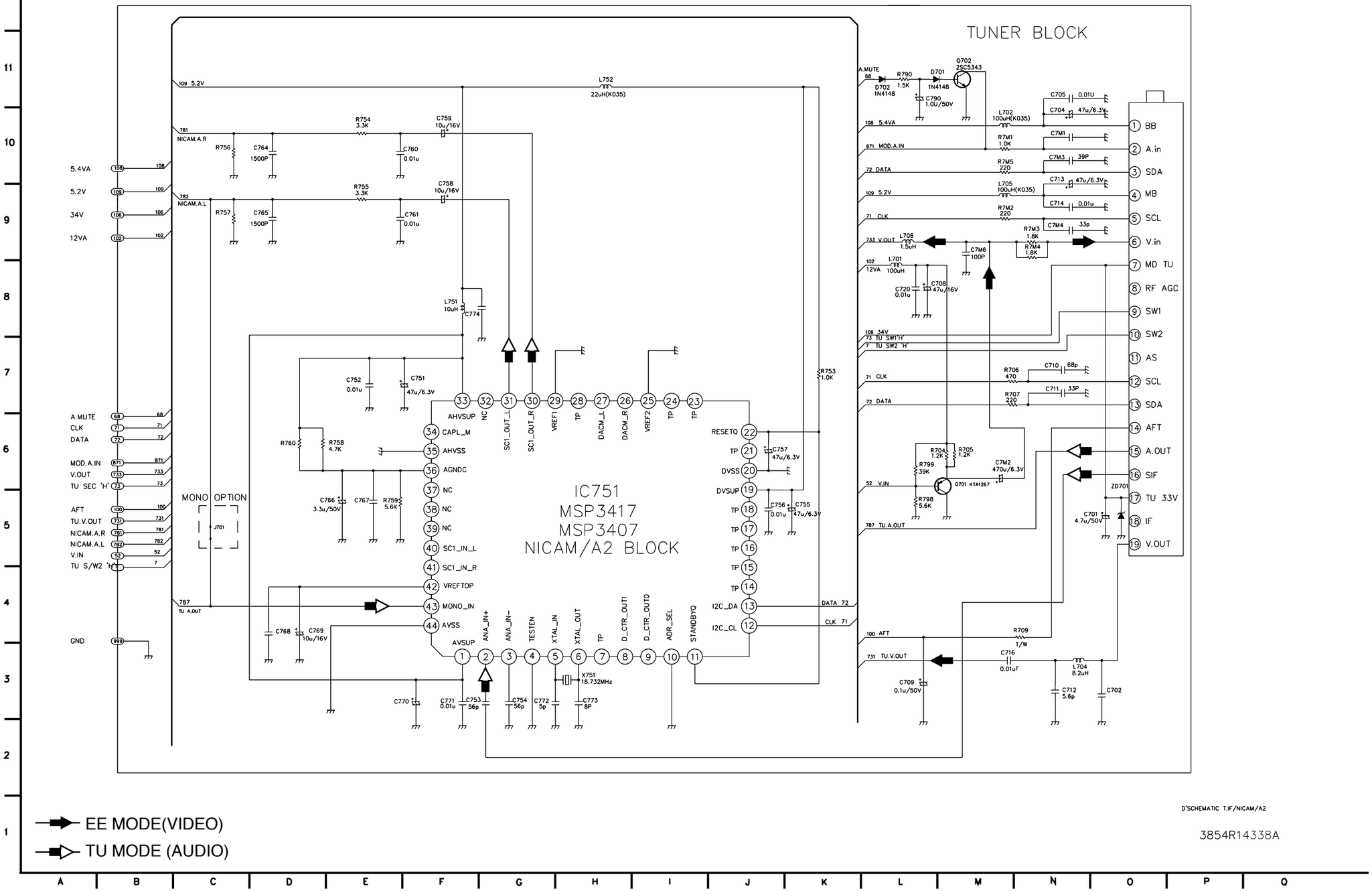
NOTE) ⚠ Warning
Parts that are shaded are critical
With respect to risk of fire or
electricial shock.

NOTE :

1. Shaded(■) parts are critical for safety. Replace only with specified part number.
2. Voltages are DC-measured with a digital voltmeter during TUNER mode.

D'SCHEM POWER
RCA
3854R14335A

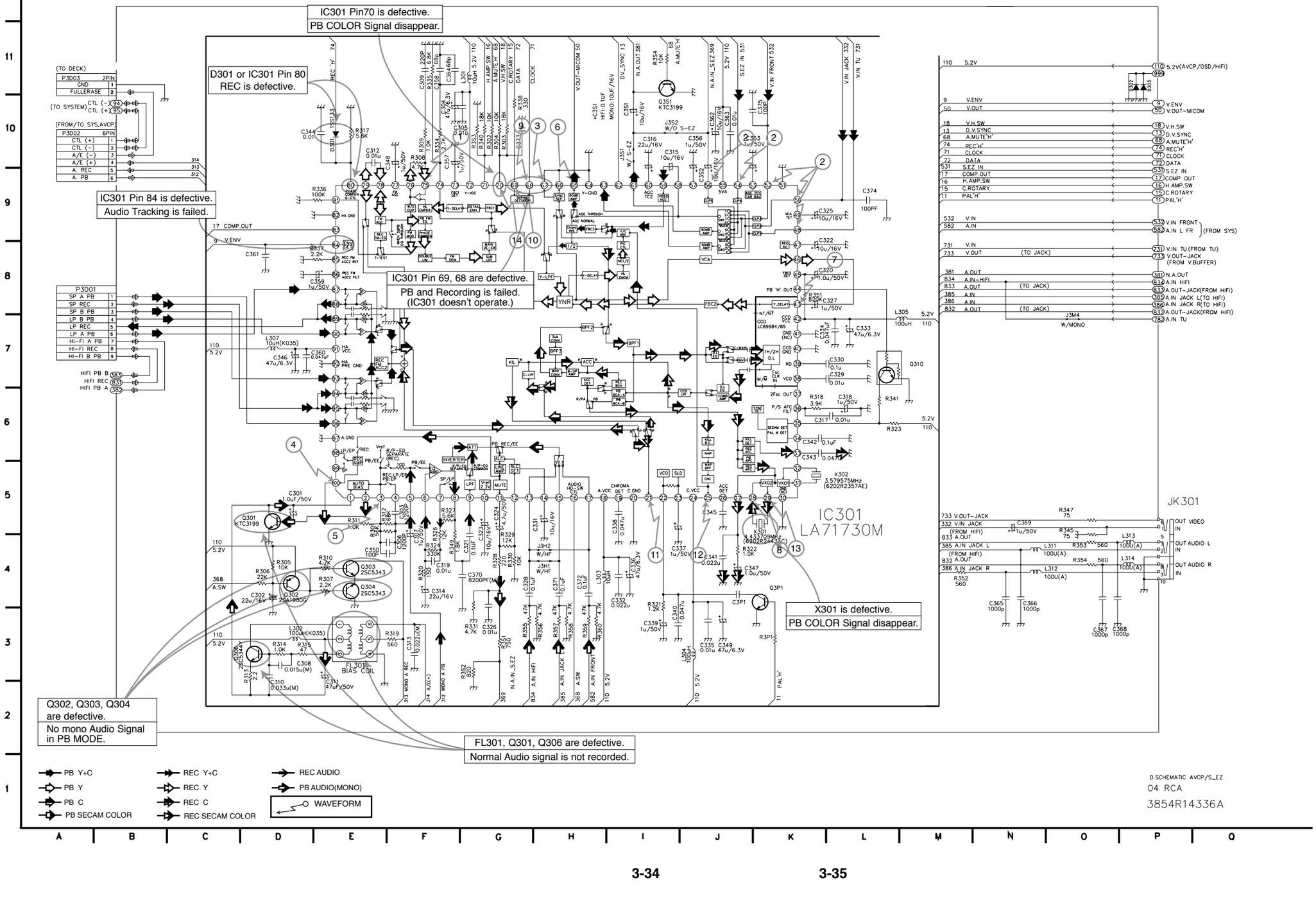
2. Tuner, NICAM, A2 Circuit Diagram



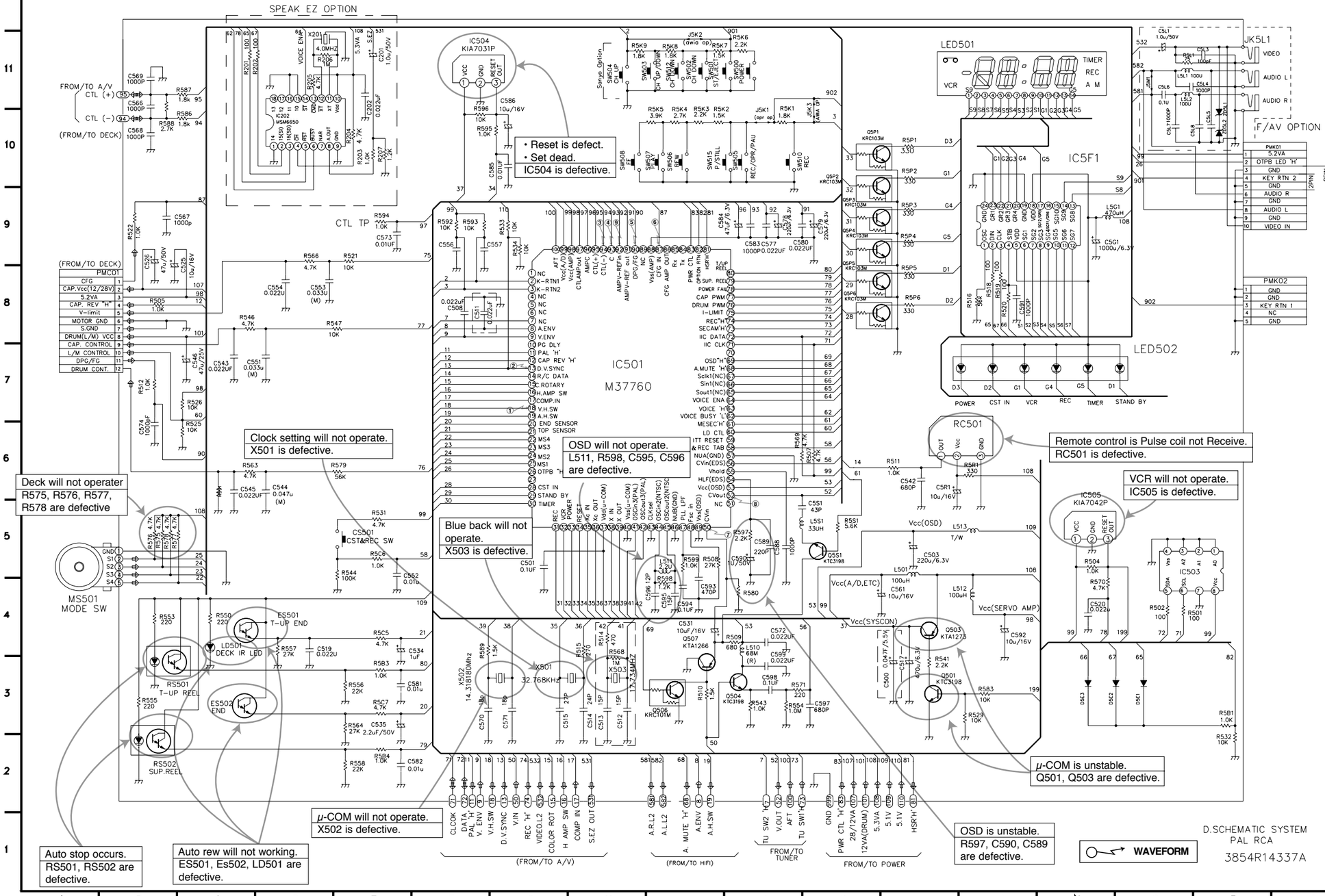
D'SCHEMATIC T.IF/NICAM/A2

3854R14338A

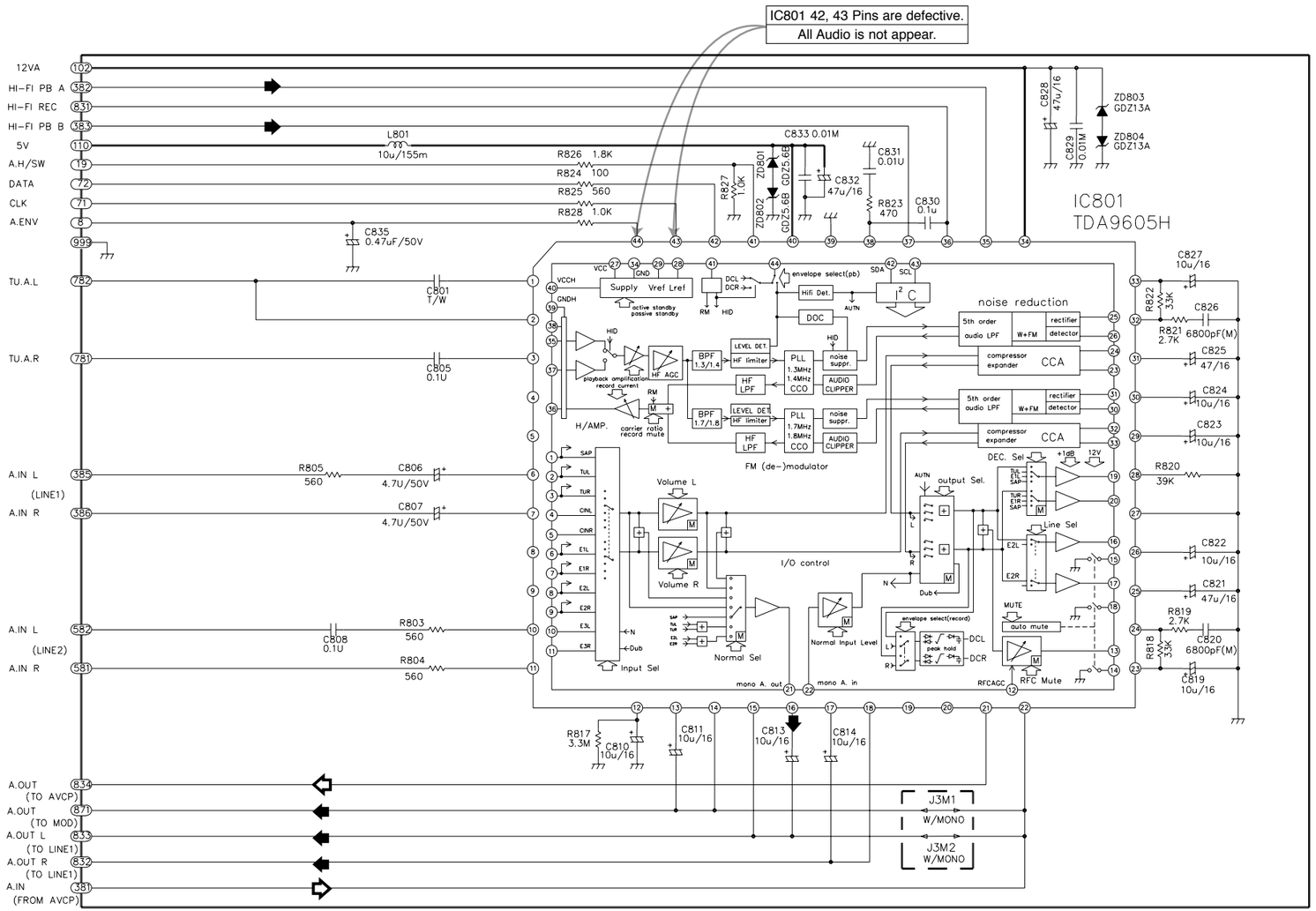
3. A/V Circuit Diagram



4. System Circuit Diagram



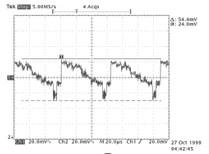
5. Hi-Fi Circuit Diagram



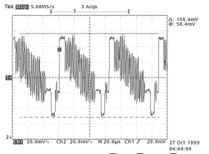
D'SCHEMATIC HI-FI
2004 PAL RCA
3854R14339A

WAVEFORM

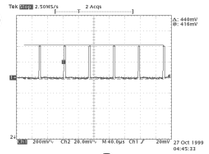
★ IC301 Oscilloscope Waveform

① 

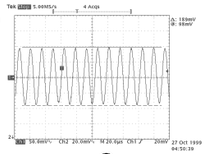
IC301 Pin ㉕
PB mode
500mvp-p

② 

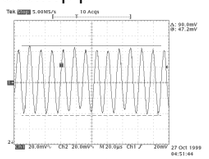
IC301 Pins ㊽ ,㊿, ㊿
㊹ , ㊻
Video in 1Vp-p

③ 

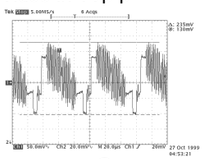
IC301 Pin ㊼
PB/REC mode
4.0Vp-p

④ 

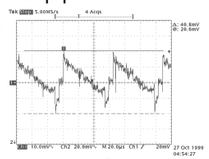
IC301 Pin ⑩⓪
REC mode
1.1Vp-p

⑤ 

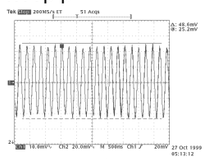
IC301 Pin ③
REC mode
2.0Vp-p

⑥ 

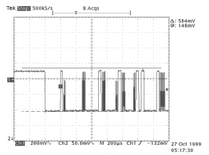
IC301 Pin ㊺
PB mode
2.02Vp-p

⑦ 

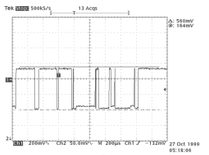
IC301 Pin ㊸
PB mode
400mVp-p

⑧ 

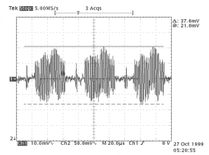
IC301 Pin ㉘
PB mode
400mVp-p

⑨ 

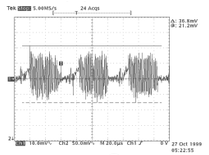
IC301 Pin ㊽
PB/REC mode
5Vp-p

⑩ 

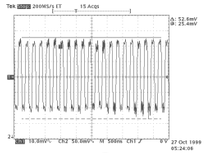
IC301 Pin ㊾
PB/REC mode
5Vp-p

⑪ 

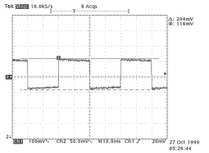
IC301 Pins ㉑
REC mode
340mVp-p

⑫ 

IC301 Pins ㉕
PB mode
300mVp-p

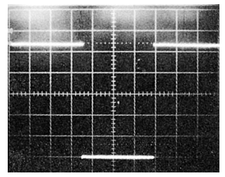
⑬ 

IC301 Pin ㉙
PB mode
400mVp-p

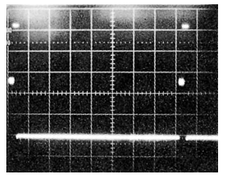
⑭ 

IC301 Pin ⑦⓪
PB mode
3.6Vp-p

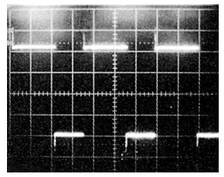
★ IC501 Waveform photographs

① 

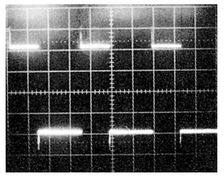
IC501 Pin ⑱
1V/5mS
REC/PB modes
(V.H/SW)

② 

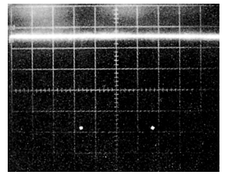
IC501 Pin ⑬
1V/2mS
QUE/REV modes
(D.V-SYNC)

③ 

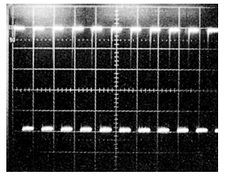
IC501 Pin ㊺
1V/10mS
REC mode
(CTL+)

④ 

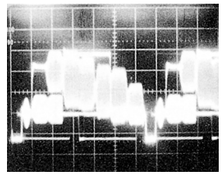
IC501 Pin ㊹
1V/10mS
REC mode
(CTL-)

⑤ 

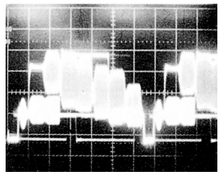
IC501 Pin ㊿
1V/10uS
REC/PB modes
(DPG)

⑥ 

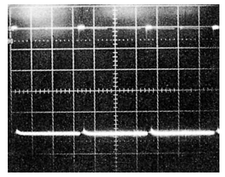
IC501 Pin ㊼
1V/1mS
REC/PB modes
(CFG)

⑦ 

IC501 Pin ㊿
100mV/10uS
EE/PB modes
(V-IN)

⑧ 

IC501 Pin ㊷
500MV/10uS
EE/PB modes
(V-OUT)

⑨ 

IC501 Pin ㊸
1V/20uS
EE/PB modes
(C-SYNC)

• CIRCUIT VOLTAGE CHART

MODE / PIN NO.	EE	PB	REC
IC202			
1	0	0	0
2	2.86	2.86	2.85
3	5.15	5.16	0
4	5.29	5.29	5.29
5	4.94	4.94	4.94
6	5.29	5.29	5.29
7	5.29	5.2	5.29
8	2.57	2.57	2.57
9	0	0	0
10	5.29	5.29	5.29
11	2.41	2.41	2.42
12	2.1	2.1	2.08
13	0	5..29	5.29
14	5.26	5.26	5.25
15	0	0	0
16	0	0	0
17	0	0	0
18	0	0	0
IC301			
1	5.15	5.14	1.7
2	0.02	0.03	0.75
3	2.29	2.29	0
4		1.46	0.5
5	2.28	2.26	2.47
6	2.29	2.28	2.29
7	2.28	2.28	2.27
8	2.27	2.27	2.27
9	2.26	2.26	3.05
10	2.29	2.29	2.28
11	2.37	2.39	2.28
12	0	0.02	0.11
13	2.26	2.3	2.28
14		0.02	
15	2.26	2.26	2.29
16	5.17	0.16	5.05
17	2.26	2.26	2.27
18	5.17	5.17	5.14
19	4.24	4.25	3.07
20	0	0	0
21	3.36	1.96	3.25
22	3.07	3.06	3.06
23	3.06	3.03	3.05
24	5.16	5.16	5.13
25	0.13	3.44	5.13
26	1.44	1.82	0
27	2.07	2.1	1.42
28	4.23	4.21	4.18
29	2.83	2.83	2.9
30	0	0	0
31	4.7	4.7	4.69
32	4.7	4.7	4.69
33	2.85	2.06	2.07
34	0.33	0.31	0.31
35	2.17	2.16	2.16

MODE / PIN NO.	EE	PB	REC
36	3.35	3.35	3.35
37	2.09	2.11	2.09
38	1.99	2.03	2.02
39	9.45	9.43	9.39
40	0	0	0
41	0	0	0
42	5.17	5.16	5.14
43	2.4	2.42	2.39
44	2.34	4.42	0.08
45	2.33	2.46	2.46
46	2.69	2.67	2.68
47	4.17	4.17	4.17
48	2.35	2.37	2.33
49	3.18	3.18	3.18
50	1.97	1.97	1.97
51	0	0	0
52	1.97	1.97	1.97
53	2.34	2.35	2.35
54	1.97	1.99	1.99
55	5.24	5.24	5.24
56	2.25	2.31	2.29
57	2.02	2.14	1.99
58	2.37		2.4
59	2.94	2.95	2.93
60	1.42	1.55	1.38
61	1.72	1.85	2.05
62	0.09	0.11	0.11
63	1.75	1.84	
64	0	0	0.
65	1.85	1.85	1.81
66	0	0	0
67	0.	0.44	0.4
68	4.79	4.91	4.81
69	4.75	4.81	4.79
70	5.27	2.69	2.69
71	0.01	0	0.01
72	5.13	5.11	5.09
73		1.98	2.21
74	2.55	2.63	2.53
75	2.46	2.63	2.45
76	2.47	0.77	2.45
77	1.59	1.59	1.49
78	2.7	3.39	2.69
79	2.02	1.91	2.52
80	1.06	1.06	4.72
81	1.11	1.12	1.11
82	0	0	0
83	5.13	1.47	1.51
84	0.46	2.43	1.75
85	0	0	1.36
86		0	2.03
87	0	0.72	0.7
88	0.71	0.72	0.7
89	0.71	0.72	0.7
90	0.71	0.72	0.7

MODE / PIN NO.	EE	PB	REC
91	5.17	5.16	5.11
92	0	0	0
93	1.95	1.93	0.73
94	1.95	1.93	0.72
95	1.95	1.93	0.72
96	1.95	1.93	4.33
97	0	0	0
98	2.29	2.29	2.4
99	0	2.29	2.4
100	2.29	2.29	2.53
IC501			
1	-	0	0
2	5.2	5.2	5.2
3	5.2	5.2	5.2
4	-	-	-
5	-	-	-
6	-	-	-
7	-	-	-
8	0	0	0
9	0	0	0
10	2.4	2.4	2.4
11		3.8	4.0
12	5	0	0
13	5	4.9	4.9
14	5	4.9	5.0
15	-	-	-
16	-	-	-
17	-	-	-
18	PULSE	PULSE	0
19	PULSE	PULSE	PULSE
20	0	0	0
21	0	0	0
22	5	4.9	5
23	5	4.9	4.9
24	5	4.9	4.9
25	0	0	0
26	-	0	0
27	-	-	-
28	0	0	0
29	0	0	0
30	0	0	0
31	0	0	0
32	0	0	0
33	0	0	0
34	5	5.2	5.2
35	PULSE	PULSE	PULSE
36	PULSE	PULSE	PULSE
37	5.2	5.2	5.2
38	PULSE	PULSE	PULSE
39	PULSE	PULSE	PULSE
40	0	0	0
41	PULSE	PULSE	PULSE
42	PULSE	PULSE	PULSE
43	0	0	0
44	PULSE	PULSE	PULSE

MODE / PIN NO.	EE	PB	REC
45	PULSE	PULSE	PULSE
46	0	0	0
47	1.4	1.4	1.4
48	0	0	0
49	0	0	0
50	VIDEO	VIDEO	VIDEO
51	-	-	-
52	VIDEO	VIDEO	VIDEO
53	5V	4.9	4.9
54	PULSE	PULSE	PULSE
55	1	1.6	1.0
56	VIDEO	VIDEO	VIDEO
57	0	0	0
58	0	0	0
59	-	-	-
60	2.6	2.6	2.6
61	0	0	0
62	-	-	-
63	-	-	-
64	0	0	0
65	PULSE	PULSE	PULSE
66	PULSE	PULSE	PULSE
67	PULSE	PULSE	PULSE
68	0	0	0
69	0	0	0
70	-	-	-
71	PULSE	PULSE	PULSE
72	PULSE	PULSE	PULSE
73	0	0	0
74	0	0	5.2
75	3.5	3.5	3.5
76	PULSE	PULSE	PULSE
77	PULSE	PULSE	PULSE
78	5	5.0	5.0
79	PULSE	PULSE	PULSE
80	PULSE	PULSE	PULSE
81	0	0	0
82	0	0	0
83	5	5	5
84	-	-	-
85	-	-	-
86	-	-	-
87	PULSE	PULSE	PULSE
88	0	0	0
89	-	-	-
90	PULSE	PULSE	PULSE
91	2.8	2.8	2.8
92	2.6	2.6	2.6
93	0	0	PULSE
94	0	PULSE	PULSE
95	0	PULSE	PULSE
96	2.8	2.8	2.6
97	PULSE	PULSE	2.6
98	5.2	5.2	5.2
99	5.2	5.2	5.2

MODE / PIN NO.	EE	PB	REC
100	0	0	0
IC503			
1	0	0	0
2	0	0	0
3	0	0	0
4	0	0	0
5	5.01	4.95	4.79
6	5.01	4.95	4.8
7	0	0	0
8	5.29	5.29	5.28
IC504			
1	5.28	5.28	5.28
2	0	0	0
3	5.28	5.28	5.28
IC505			
1	5.28	5.28	5.28
2	0	0	0
3	4.87	4.87	4.87
IC506			
1	2.22	2.12	2.14
2	5.16	5.15	2.15
3	2.85	2.86	2.85
4	5.11	5.11	5.11
5	4.58	4.38	4.44
6	1.78	2.15	1.41
7	2.11	2.14	2.58
8	2.64	2.62	2.6
9	1.95	2.04	1.51
10	1.52	1.62	1.52
11	1.96	2.27	1.41
12	1.96	1.79	1.95
13	0.61	0.59	0.64
14	1.41	1.38	1.43
15	0.53	0.48	0.53
16	0.53	0.48	0.54
17	1.14	1.13	1.13
18	4.49	4.41	4.47
19	0	0	0
20	1.13	1.15	1.2
21	1.14	1.13	1.21
22	1.12	1.13	1.2
23	1.24	1.25	1.35
24	0	0	0
IC801			
1	2.84	2.91	2.7
2	2.92	2.91	2.81
3	2.91	2.9	2.81
4	2.82	2.81	2.68
5	2.8	2.86	2.67
6	2.8	2..86	2.66
7	2.79	2.85	2.65
8	2.78	2.85	2.65
9	2.79	2.84	2.66
10	2.79	2.84	2.66
11	2.77	2.83	2.65

MODE / PIN NO.	EE	PB	REC
12	2.76	2.82	2.64
13	2.71	2.75	2.59
14	2.49	2.51	2.33
15	2.48	2.51	2.32
16	2.64	2.67	2.49
17	2.64	2.68	2.5
18	1.48	2.57	2.32
19	2.63	2.67	2.5
20	2.6	2.63	2.5
21	2.57	2.59	2.47
22	2.66	2.86	2.55
23	2.63	2.64	2.51
24	2.5	2.5	2.39
25	2.52	2.53	2.4
26	2.36	2.37	2.27
27	0.01	0	0
28	2.51	2.47	2.41
29	2.6	2.57	2.46
30			
31	2.34	2.41	1.38
32	0.03	0.02	-0.07
33	0.03	0.04	-0.06
34	12.6	12.5	12.57
35	3.35	3.31	2.89
36	3.29	3.3	2.9
37	3.29	3.3	2.9
38	3.55	3.56	3.42
39	0	0	0.01
40	5.2	5.2	5.21
41	2.27	2.29	2.5
42	4.96	4.98	4.91
43	5.05	5.06	4.97
44	2.8	2.79	2.69
IC751			
1	5.14	5.15	5.15
2	1.51	1.51	1.51
3	1.51	1.51	1.51
4	0	0	0
5	2.47	2.48	2.48
6	2.47	2.48	2.48
7	0.54	0.5	0.46
8	0	0	0.45
9	0	0	0.45
10	0	0	0
11	5.16	5.16	5.16
12	4.91	4.86	4.79
13	4.9	4.8	4.79
14	2.58	0.51	0.57
15	2.58	0.5	0
16	2.41	0.51	0.57
17	0.53	0.53	0
18	0.54	0.51	0.58
19	5.13	5.14	5.14
20	0	0	0
21	0.53	0.51	0

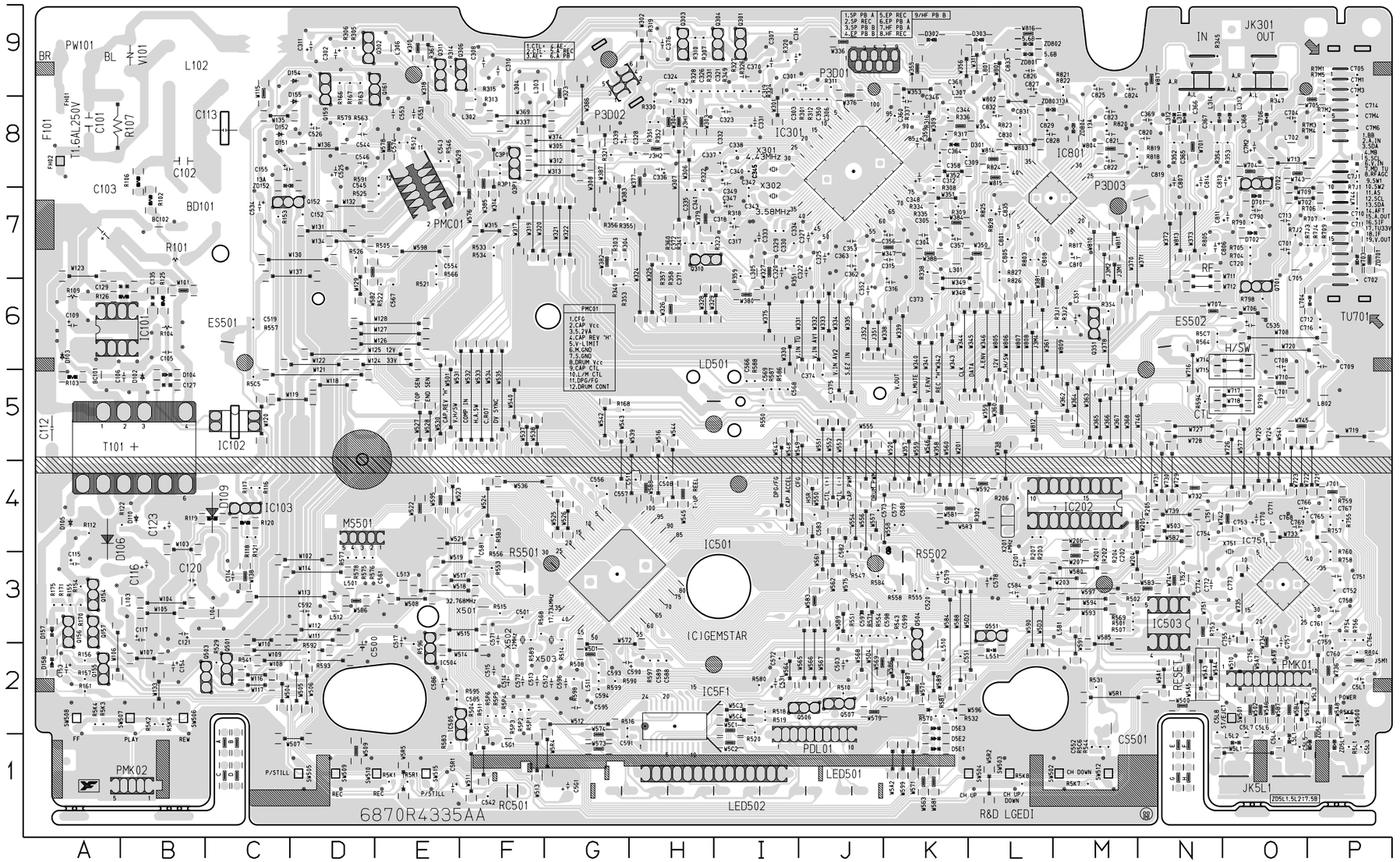
MODE / PIN NO.	EE	PB	REC
22	5.16	5.16	5.16
23	0	0.02	0
24	0	0.02	0
25	0	0	0
26	0	0.05	0
27	0.05	0.05	0
28	0	0	0
29	0	0	2.8
30	2.8	2.8	2.8
31	2.79	2.79	2.79
32	0	0.02	0
33	5.16	5.14	5.15
34	4.2	4.2	4.21
35	0	0	0
36	2.8	2.8	2.8
37			0
38			0
39			0
40	2.84	2.84	2.79
41	2.85	2.83	2.79
42	2.59	2.59	2.59
43	2.31	2.31	2.3
44	3.3		0

Transistor	EE Mode			PB Mode			REC Mode		
	EE	PB	REC	EE	PB	REC	EE	PB	REC
Q151	4.55	5.3	5.24	5.34	4.54	5.24	5.3	4.55	5.24
Q152	5.31	4.52	5.22	5.31	4.52	5.22	5.3	4.51	5.22
Q154	32.99	32.34	32.97	33.53	32.89	33.5	33.76	33.12	33.72
Q155	12.73	13.4	14.05	12.68	13.35	13.77	12.76	13.42	13.98
Q157	0.03	0.84	4.38	0.03	0.84	4.38	-0.03	0.84	4.38
Q159	29.84	29.78	13.21	29.79	29.8	12.48	30.14	30.13	12.73
Q161	0.03	0	29.82	0.03	0	29.8	-0.03	0	30.11
Q162	0.02	0.69	0	-0.02	0.69	0	-0.02	0.69	0
Q163	0.03	5.18	0.03	0.03	5.18	0.03	-0.03	5.18	0.03
Q164	-0.03	4.38	-0.01	-0.03	4.38	-0.01	-0.03	4.38	0
Q165	14.06	-0.01	14.04	13.74	-0.01	13.71	13.95	-0.01	13.95
Q166	4.4	5.3	5.11	5.3	4.41	5.13	5.3	4.4	5.1
Q301	0	0.01	5.15	0	0	5.15	0	0.75	1.69
Q302	5.18	5.18	-0.42	5.18	4.52	5.12	5.14	5.13	-24.71
Q303	0.01	-0.42	0	0	0.69	0.01	-18.22	-24.85	0.01
Q304	0.01	-0.4	0	0	0.71	0	-18.22	-24.7	0
Q305	2.01	1.29	0	2.53	1.83	0	2.5	1.81	0
Q306	5.14	5.19	5.19	5.19	5.16	5.19	1.9	2.14	4.89
Q307	2.69	1.98	0	2.69	1.98	0	2.64	1.93	0
Q308	2.66	1.98	0	2.63	1.96	0	2.6	1.93	0
Q309	3.09	2.41	0	3.05	2.37	0	3.01	2.33	0

	Emitter		Collector		Base	
	REC	PB	REC	PB	REC	PB
Q501	0	0	0	0	0.6	0.6
Q503	5.2	5.2	5.1	5.1	4.43	4.43
Q506	0	0	VIDEO	VIDEO	0	0
Q504	VIDEO	VIDEO	5.0	5.0	VIDEO	VIDEO

PRINTED CIRCUIT BOARD DIAGRAMS

1. MAIN P.C.Board

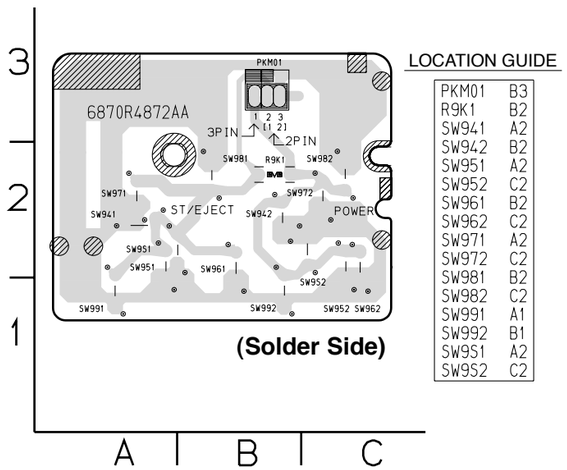


LOCATION GUIDE

C152	D7	C589	H2	R168	G5	R3S2	H8	R598	G2	R5R1	E1
C202	M4	C591	G1	R170	A3	R3S3	G6	R599	G2	R5S1	J3
C303	I8	C593	G2	R171	A3	R3S4	M6	R5B1	K2	R704	O7
C305	K7	C594	G2	R175	A3	R501	M3	R5B3	F4	R705	O7
C306	J8	C597	J3	R201	M4	R502	M3	R5B4	J3	R706	P7
C309	K8	C598	K3	R202	M4	R504	F2	R5C5	C5	R707	P7
C312	K8	C599	K3	R203	L4	R505	E7	R5C6	M1	R709	P7
C317	I7	C5L3	P1	R204	M4	R507	M3	R5C7	N6	R753	N3
C319	I9	C5L4	O1	R205	N4	R508	G2	R5K1	E1	R754	P3
C321	I9	C5L5	O1	R206	L4	R509	K2	R5K2	B2	R755	P4
C326	H9	C5L6	O2	R207	L4	R510	J2	R5K3	A2	R756	P3
C328	H8	C5L7	O2	R301	J8	R511	F2	R5K4	A2	R757	P4
C329	I7	C5L8	N2	R302	L4	R512	E8	R5K5	B2	R758	P3
C330	I7	C5S1	K2	R303	G7	R514	G3	R5K6	P2	R759	P4
C332	I8	C702	P6	R304	G7	R515	F3	R5K7	M1	R760	P3
C334	I7	C705	P9	R305	D9	R516	G2	R5K8	L1	R790	O7
C335	H7	C710	P7	R306	D9	R518	I2	R5L1	P1	R798	O6
C338	I8	C711	P7	R307	H9	R519	I2	R5P1	F2	R799	O5
C340	I8	C712	P6	R308	K7	R520	I2	R5P2	F2	R7J1	P8
C341	H7	C714	P8	R309	K7	R521	E6	R5P3	F2	R7J2	O7
C342	I7	C716	P6	R310	H9	R522	E6	R5P4	F2	R7J3	P7
C343	I7	C720	O7	R311	J9	R525	E7	R5P5	F2	R7J4	P7
C344	K8	C752	P3	R312	J8	R526	D7	R5P6	F2	R7M1	P9
C345	I8	C753	O4	R313	F8	R529	C2	R5R1	E1	R7M2	P8
C350	J8	C754	N4	R314	E9	R531	M2	R5S1	J3	R7M3	P8
C358	K8	C756	O3	R315	F9	R532	K2	R704	O7	R7M4	P8
C360	K8	C760	P2	R316	K8	R533	F7	R705	O7	R7M5	P9
C361	K9	C761	P3	R317	K8	R534	F7	R706	P7	R803	L7
C363	J7	C764	P3	R318	I7	R541	C2	R707	P7	R804	P2
C364	K8	C765	P4	R319	H9	R543	K3	R709	P7	R805	N7
C365	N8	C767	P4	R320	I9	R544	M1	R753	N3	R817	M7
C366	N8	C768	O4	R321	G8	R546	E8	R754	P3	R818	M8
C367	N8	C771	O4	R322	H7	R547	J3	R755	P4	R819	M8
C368	O8	C774	N3	R323	H7	R550	I5	R756	P3	R820	M8
C371	H7	C7J1	P8	R324	I9	R553	F3	R757	P4	R821	M9
C372	H7	C7M1	P9	R326	I9	R554	J3	R758	P3	R822	M9
C373	K6	C7M3	P9	R327	I9	R555	K3	R759	P4	R823	L8
C374	J5	C7M4	P8	R328	H9	R556	F4	R760	P3	R824	L8
C375	J5	C7M6	P8	R329	H8	R557	C6	R790	O7	R825	L7
C3P1	F8	C801	L7	R330	H8	R558	K3	R798	O6	R826	L6
C501	F3	C805	L7	R331	H9	R563	D8	R799	O5	R827	L7
C508	H4	C808	L7	R334	K7	R564	N6	R7J1	P8	R828	L7
C511	H4	C829	L8	R335	K7	R566	E7	R7J2	O7		
C519	C6	C830	L8	R336	K8	R568	F3	R7J3	P7		
C520	K3	C831	L8	R337	K8	R569	M3	R7J4	P7		
C542	F1	C833	L9	R338	K7	R570	K2	R7M1	P9		
C543	E8	IC301	J8	R340	G7	R571	J3	R7M2	P8		
C545	E8	IC501	G3	R341	H7	R575	D3	R7M3	P8		
C552	M1	IC5F1	H2	R345	N9	R576	D3	R7M4	P8		
C554	E7	IC751	O3	R347	O9	R577	D3	R7M5	P9		
C556	G4	IC801	L7	R349	I9	R578	D3	R803	L7		
C557	G4	R112	A4	R351	I7	R579	D8	R804	P2		
C566	I5	R116	C4	R352	N8	R580	I2	R805	N7		
C567	E6	R117	C4	R353	O8	R583	E1	R817	M7		
C568	I5	R118	C4	R354	N8	R586	I5	R818	M8		
C569	I5	R121	C4	R355	G7	R587	I5	R819	M8		
C572	I2	R122	B4	R356	G7	R588	I5	R820	M8		
C573	J4	R153	C7	R357	H7	R589	F3	R821	M9		
C574	E8	R154	A3	R358	H7	R590	G2	R822	M9		
C577	K4	R155	A3	R359	I7	R591	E8	R823	L8		
C580	K4	R156	A2	R360	H7	R592	D2	R824	L8		
C581	F4	R157	A2	R361	E9	R593	D2	R825	L7		
C582	J3	R161	A2	R3J1	M6	R594	N5	R826	L6		
C583	J4	R163	D9	R3J2	M6	R595	E2	R827	L7		
C585	E2	R166	D9	R3P1	F8	R596	E2	R828	L7		
C588	H2	R167	D9	R351	H8	R597	H2				

(Solder Side)

2. KEY (LEFT) P.C.Board



(Solder Side)

LOCATION GUIDE

PKM01	B3
R9K1	B2
SW941	A2
SW942	B2
SW951	A2
SW952	C2
SW961	B2
SW962	C2
SW971	A2
SW972	C2
SW981	B2
SW982	C2
SW991	A1
SW992	B1
SW9S1	A2
SW9S2	C2

SECTION 4 MECHANISM (D-37)

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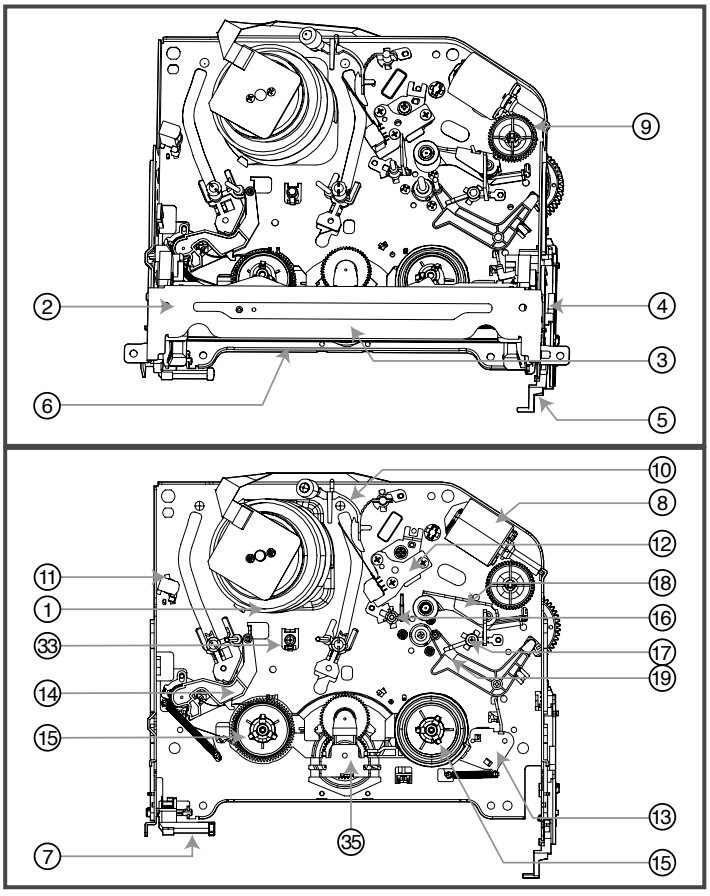
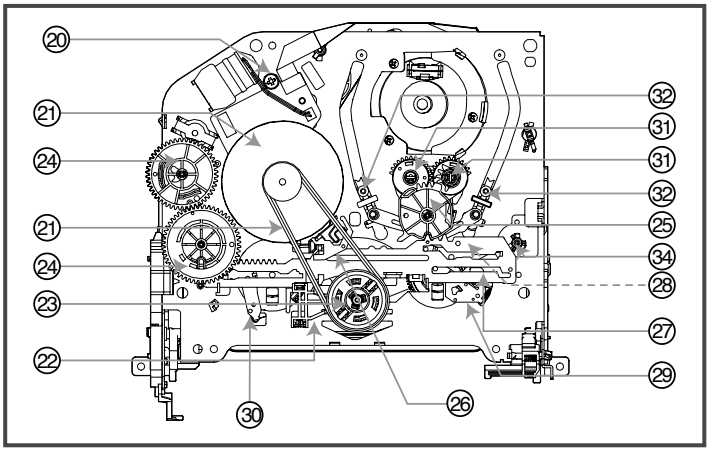
POSITION DRAWING OF DECK MECHANISM PARTS

• Top View



• Bottom View



NOTE : Assembly order is a reverse of disassembly order.

(1) For assembly, check the assembly mode is accurate.
(2) Parts firstly disassembled indicate parts firstly disassembled in disassembly of related parts.

Order Of Disassembled / Parts firstly Disassembled		Part	Fixing Type	Ref. Drawings	Position
	1	Drum Assembly	3 screws	A-1	T
	2	Plate Top	2 hooks	A-2	T
2	3	Holder Assembly CST	6 chasses	A-2	T
2,3	4	Gear Assembly Rack F/L	1 hook	A-2	T
2,3,4	5	Opener Door	Chassis Hole	A-2	T
2,3,4,5	6	Arm Assembly F/L	Chassis Hole	A-2	T
	7	Lever Assembly S/W	Chassis Hole, 1 hook	A-2	T
	8	Motor Assembly L/D	1 screw	A-3	T
	9	Gear Wheel	2 hooks	A-3	T
	10	Arm Assembly Cleaner	Chassis Embossing	A-3	T
	11	Head F/E	Chassis Embossing	A-3	T
	12	Base Assembly A/C Head	1 screw	A-3	T
2,3	13	Brake Assembly T	1 hook	A-4	T
2,3	14	Arm Assembly Tension	1 hook	A-4	T
2,3,13,14	15	Reel S / Reel T	Shaft	A-4	T
	16	Base Assembly P4	Chassis Embossing	A-5	T
	17	Opener Lid	Chassis Embossing	A-5	T
17	18	Arm Assembly Pinch	Shaft	A-5	T
17	19	Arm T/up	1 hook	A-5	T
	20	Supporter, capstan	Chassis Hole	A-6	B
17,18	21	Belt Capstan/Motor Capstan	3 screws	A-6	B
	22	Lever F/R	Locking Tab	A-6	B
21, 22	23	Clutch Assembly D37	Washer	A-6	B
	24	Gear Drive/Gear Cam	Washer/Hook	A-7	B
	25	Gear Sector	Hook	A-7	B
21	26	Brake Assembly Capstan	Chassis Hole	A-7	B
21,22,23, 24,2526	27	Plate Slider	Chassis Guide	A-7	B
21,22,23, 24,2526,27	28	Lever Tension	1 Hook	A7	B
21,22,23, 24,2526,27	29	Lever Spring	1 Hook	A-7	B
21,22,23, 24,2526,27	30	Lever Brake	1 Hook	A-7	B
25	31	Gear Assembly P2/ Gear Assembly P3	Bass	A-8	B
2, 3, 14, 25, 31	32	Base Assembly P2 /Base Assembly P3	6 Chasses	A-8	B
25, 31	33	Base Loading	3 Hooks	A-8	B
2,3,14	34	Base Tension	Chassis Embossing	A-9	T
	35	Arm Assembly Idler Jog	Locking Tab	A-9	T

T:Top, B:Bottom

DISASSEMBLY AND ASSEMBLY OF DECK MECHANISM

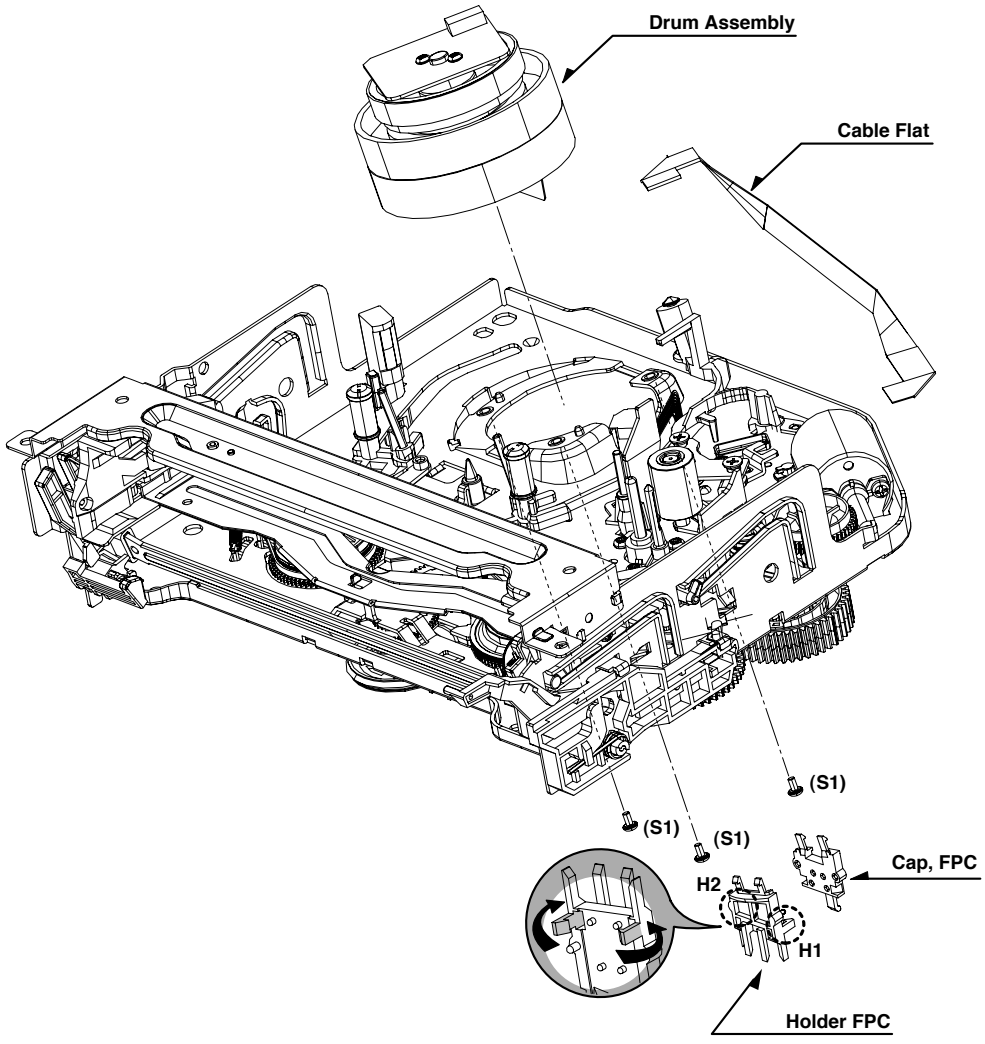
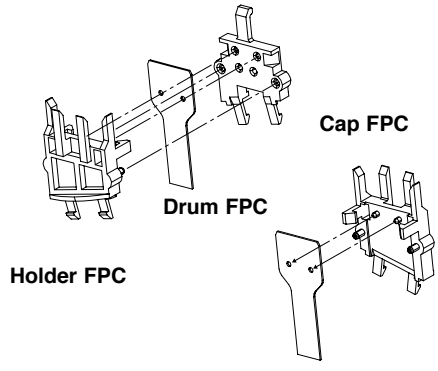


Fig. A-1

1. Disassembly of Drum Assembly (Figure A-1)

1) Separate cable flat from the Drum FPC and the Capstan Motor.
2) Release 3 screws (S1) on the bottom side of the chassis, and separate the drum assembly.
3) Release the hooks (H1, H2) and separate both the holder FPC and the Cap FPC (disassemble if necessary).

Cautions in assembly of FPC



Assembly shape seen in the reverse direction

DISASSEMBLY AND ASSEMBLY OF DECK MECHANISM

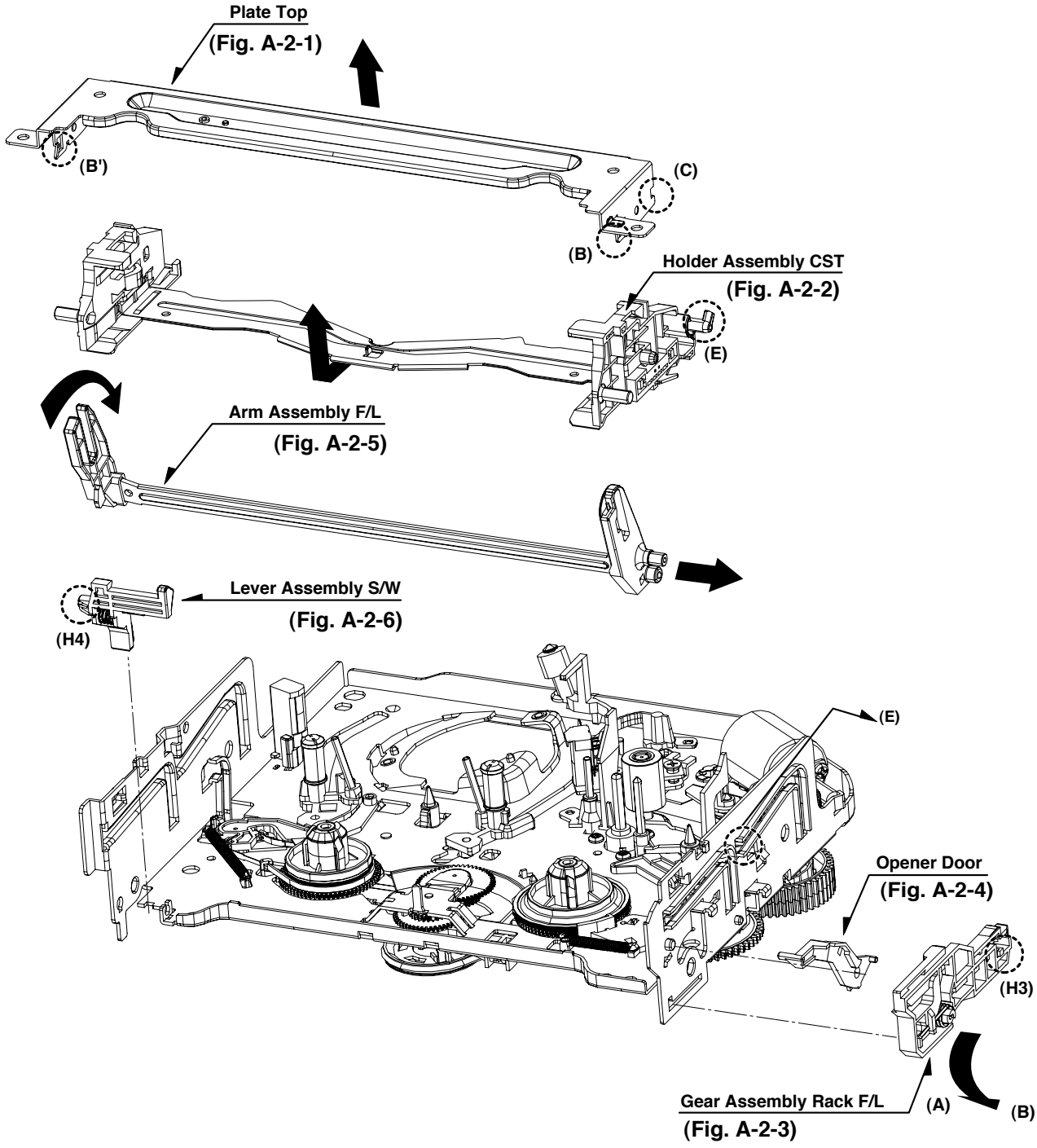


Fig. A-2

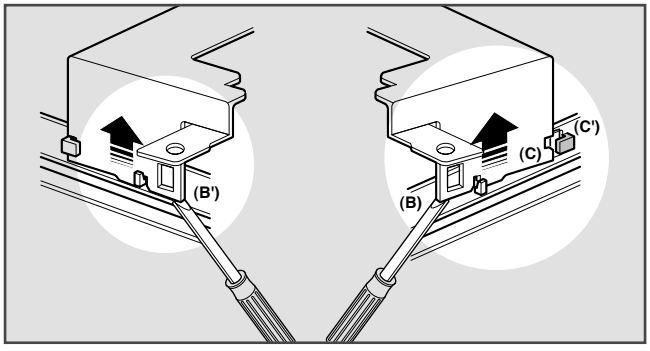
DISASSEMBLY AND ASSEMBLY OF DECK MECHANISM

2. Disassembly of Plate Top (Fig. A-2-1)

1) Separate the right part while leaning back the (B) part of the plate top toward the arrow direction.
2) Separate the left part while leaning back the (B') part of the plate top toward the arrow direction.
(Tool used: Tool such as (-) driver, auger, etc with pointed or flat end)

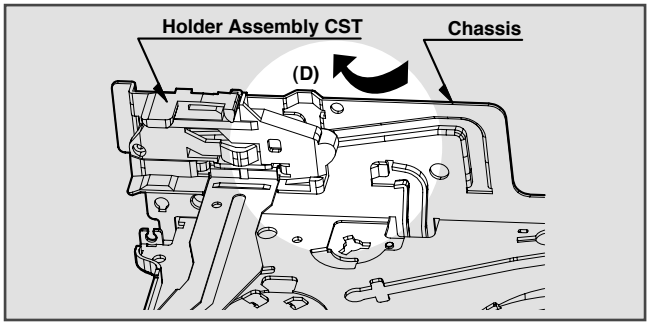
CAUTIONS

Assemble while pressing the (C), (C') part after corresponding them as in drawing.



3. Holder Assembly CST (Fig. A-2-2)

1) Firstly separate the left part from the groove on the (D) part of chassis while moving the holder assembly CST toward the arrow direction.



2) Separate the right part from each groove of chassis

CAUTIONS

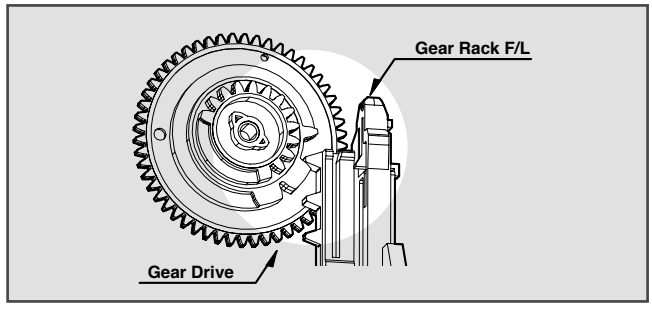
Assemble by inserting the left part after firstly inserting the (E) part of the holder assembly CST into the groove on the (E') part of chassis.

4. Disassembly of Gear Assembly Rack F/L (Fig. A-2-3)

1) Separate the hook (H3) while leaning ahead the hook (3) after moving the gear assembly rack F/L toward the arrow (A) direction.
2) Separate the gear assembly rack F/L toward the arrow (B) direction.

CAUTIONS

For the assembly, correspond the gear part of gear assembly rack F/L to the gear drive.



5. Opener Door (Fig. A-2-4)

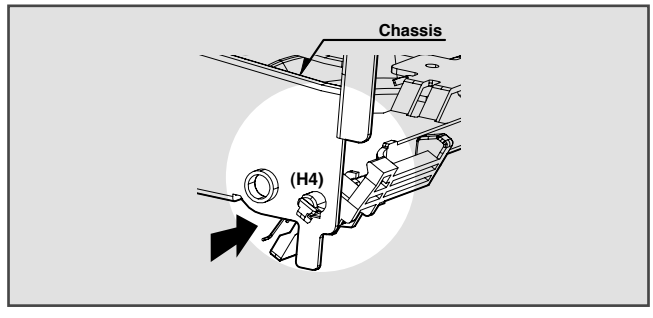
1) Separate the opener door ahead from the guide hole of chassis while turning it clockwise.

6. Arm Assembly F/L (Fig. A-2-5)

1) Firstly separate the left part of the arm assembly F/L from the groove of chassis while pushing the arm assembly F/L toward the arrow direction.
2) Separate the right part from the groove of chassis.).

7. Lever Assembly S/W (Fig. A-2-6)

1) Separate the lever assembly S/W while pushing it toward the arrow direction after removing the hook (4) on the left side of chassis.



DISASSEMBLY AND ASSEMBLY OF DECK MECHANISM

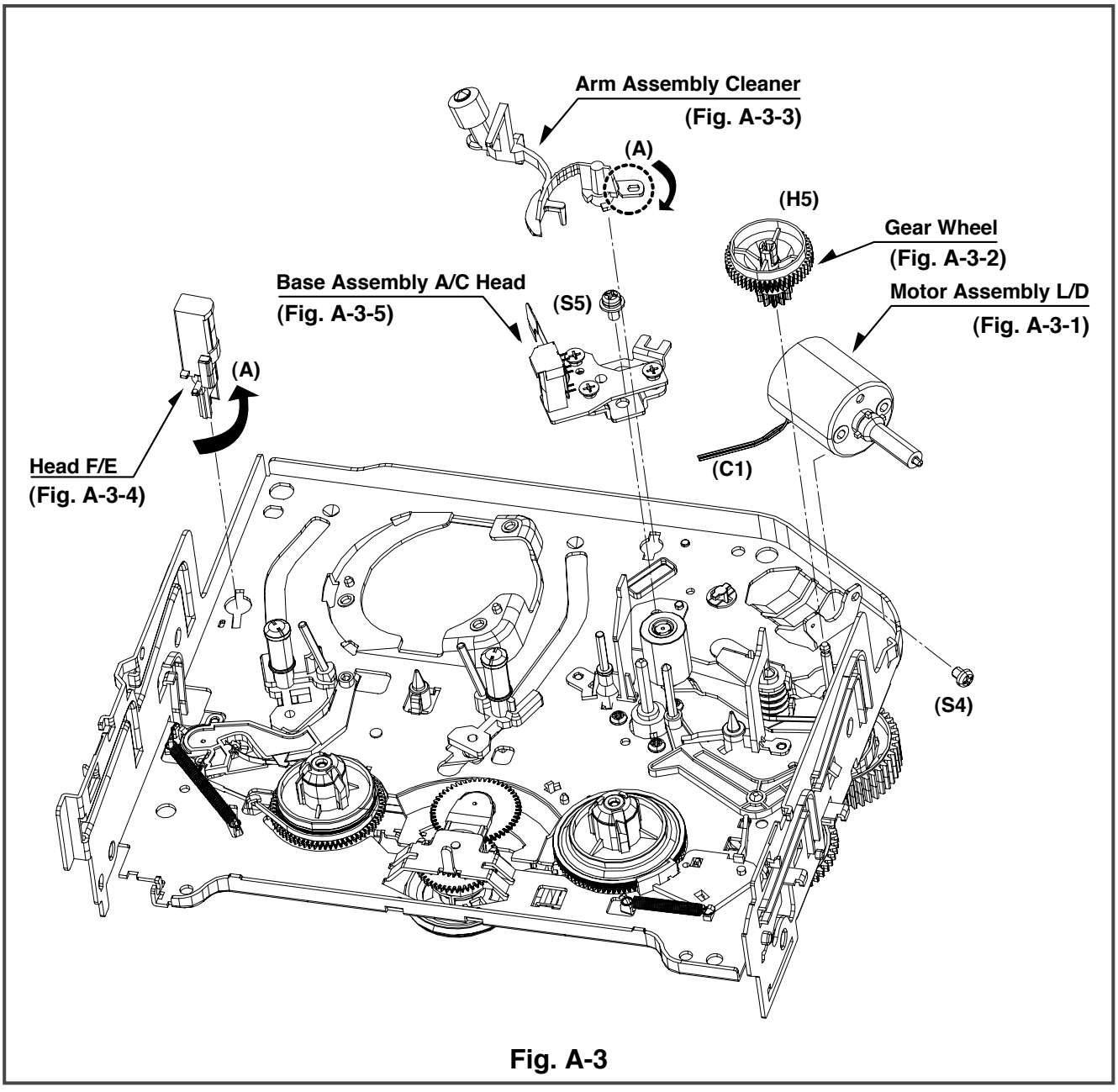


Fig. A-3

8. Motor Assembly L/D (Fig. A-3-1)

1) Take the connector (C1) connected to the Capstan motor PCB out.
2) Remove a screw (S4) of the chassis (S4) and step backward, and disassemble it while holding it up.

9. Gear Wheel (Fig. A-3-2)

1) Release the hook (H5) of the gear wheel and disassemble it upward.

10. Arm Assembly Cleaner (Fig. A-3-3)

1) Separate the (A) part of Fig. A-3-1 from the embossing of chassis, and hold it up while turning it anti-clockwise.

11. Head F/E (Fig. A-3-4)

1) Separate the (A) part of the head F/E from the embossing of chassis, and hold it up while turning it anti-clockwise.

12. Base Assembly A/C Head (Fig. A-3-5)

1) Release a screw (S5) and disassemble while holding it up.

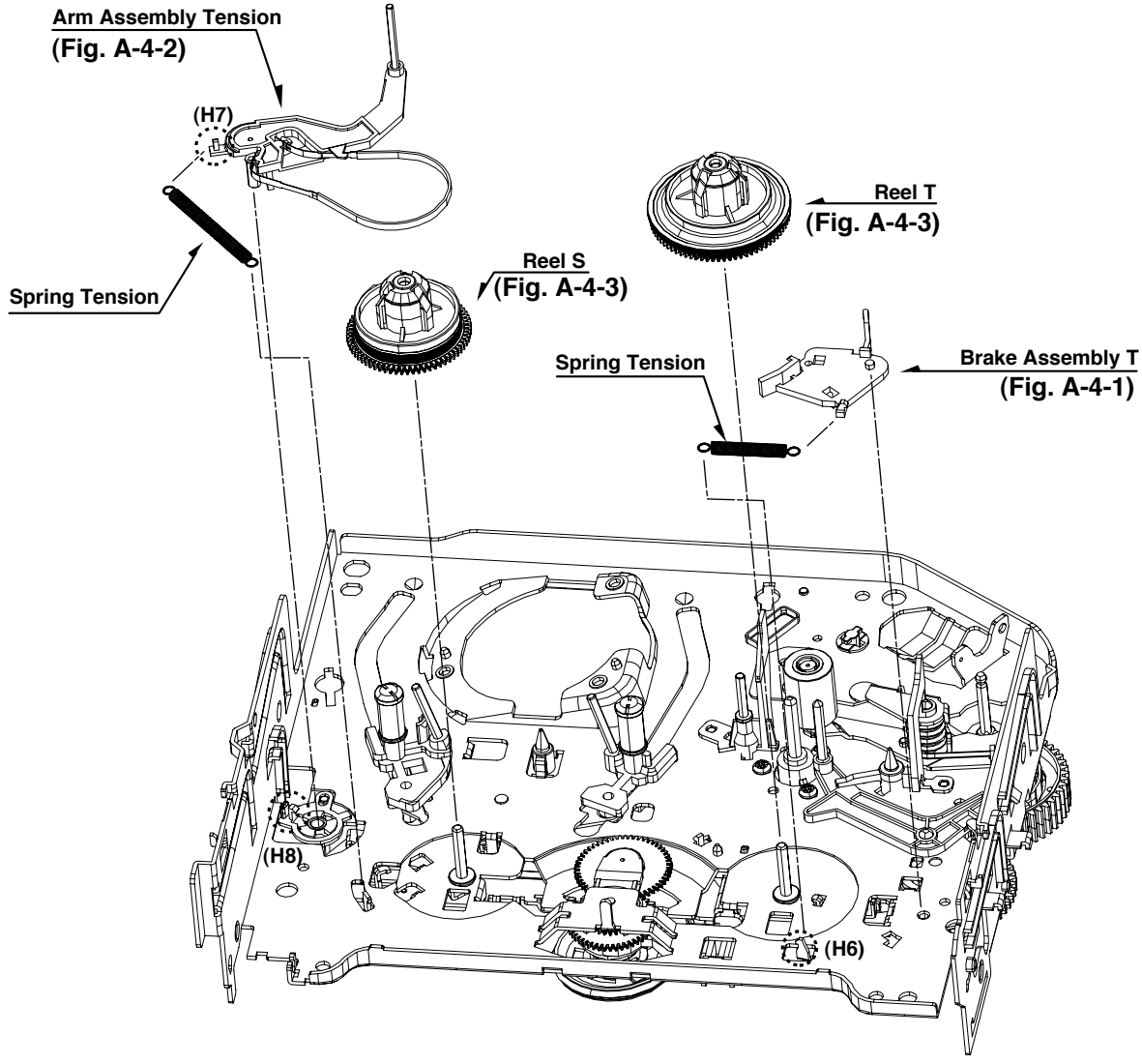


Fig. A-4

13. Brake Assembly T (Fig. A-4-1)

1) Release the spring tension from the lever spring hook (H6).
2) Disassemble the brake assembly T while holding it upward.

14. Arm Assembly Tension (Fig. A-4-2)

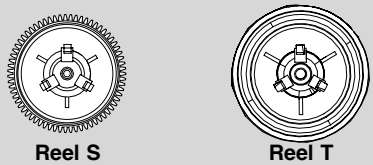
1) Release the spring tension the hook (H7) from the arm assembly tension.
2) After releasing the hook (H8) of the base tension, separate it while holding it up.

CAUTIONS

Spring used for both brake assembly T and arm assembly tension is used (2EA used).

15. Reel S/Reel T (Fig. A-4-3)

1) Disassemble the reel S/ reel T while holding it up (comparison between Reel S and Reel T)



DISASSEMBLY AND ASSEMBLY OF DECK MECHANISM

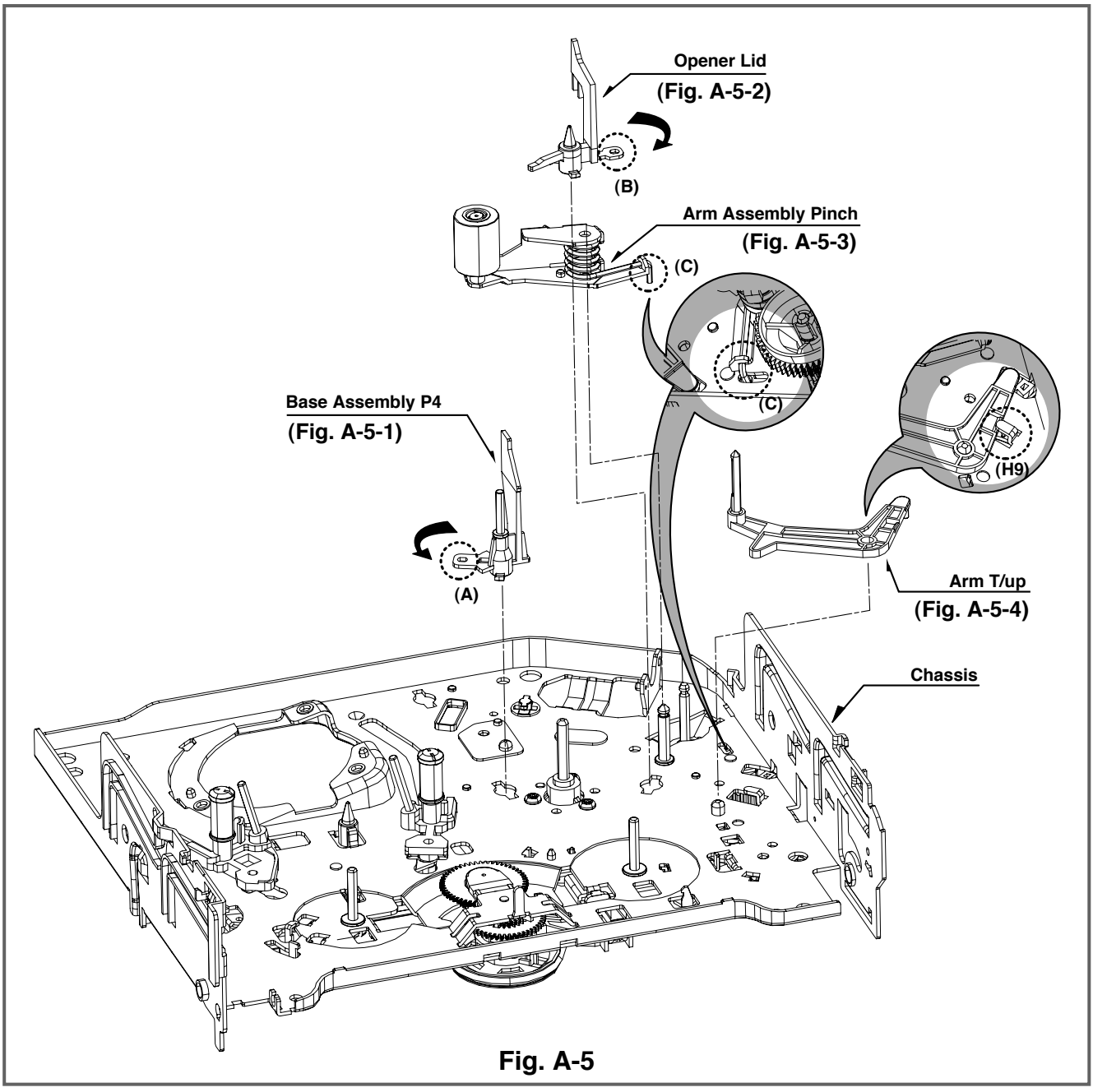


Fig. A-5

16. Base Assembly P4 (Fig. A-5-1)

1) Release the (A) part of the base assembly P4 from the embossing of chassis.
2) Hold the base assembly P4 up while turning it anti-clockwise.

17. Opener Lid (Fig. A-5-2)

1) Release the (B) part of the opener lid from the embossing of chassis.
2) Disassemble the opener lid upward while turning it anti-clockwise.

18. Arm Assembly Pinch (Fig. A-5-3)

1) Hold the arm assembly pinch up.

19. Arm T/up (Fig. A-5-4)

1) Turn the arm T/up to release the anchor jaw (H9) part of chassis and then hold it upward.

CAUTIONS

For the assembly, check the (C) part of the arm assembly pinch is assembled as in drawing.

- REVERSE THE MECHANISM.

DISASSEMBLY AND ASSEMBLY OF DECK MECHANISM

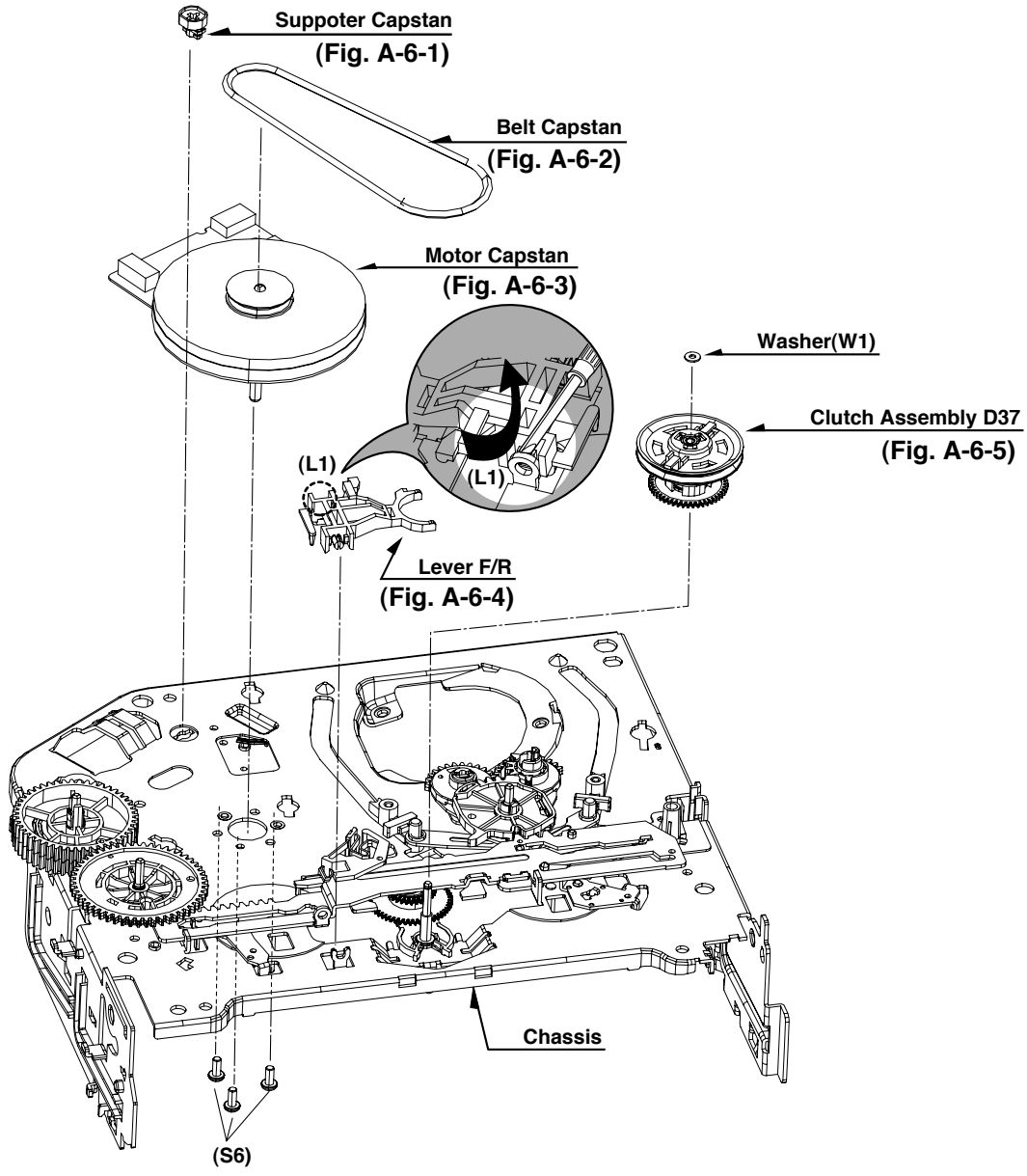


Fig. A-6

20. Supporter, Capstan (Fig. A-6-1)

1) Turn the supporter and Capstan by 90 deg. clockwise with a driver for disassembly.

21. Belt Capstan (Fig. A-6-2) / Motor Capstan (Fig. A-6-3)

1) Separate the belt Capstan.
2) Undo 3 screws (S6) on the bottom side of chassis and disassemble it upward.

22. Lever F/R (Fig. A-6-4)

1) Release the locking tab (L1) and then disassemble it upward.

23. Clutch Assembly D37 (Fig. A-6-5)

1) Remove the washer (W1) and then disassemble it upward.

DISASSEMBLY AND ASSEMBLY OF DECK MECHANISM

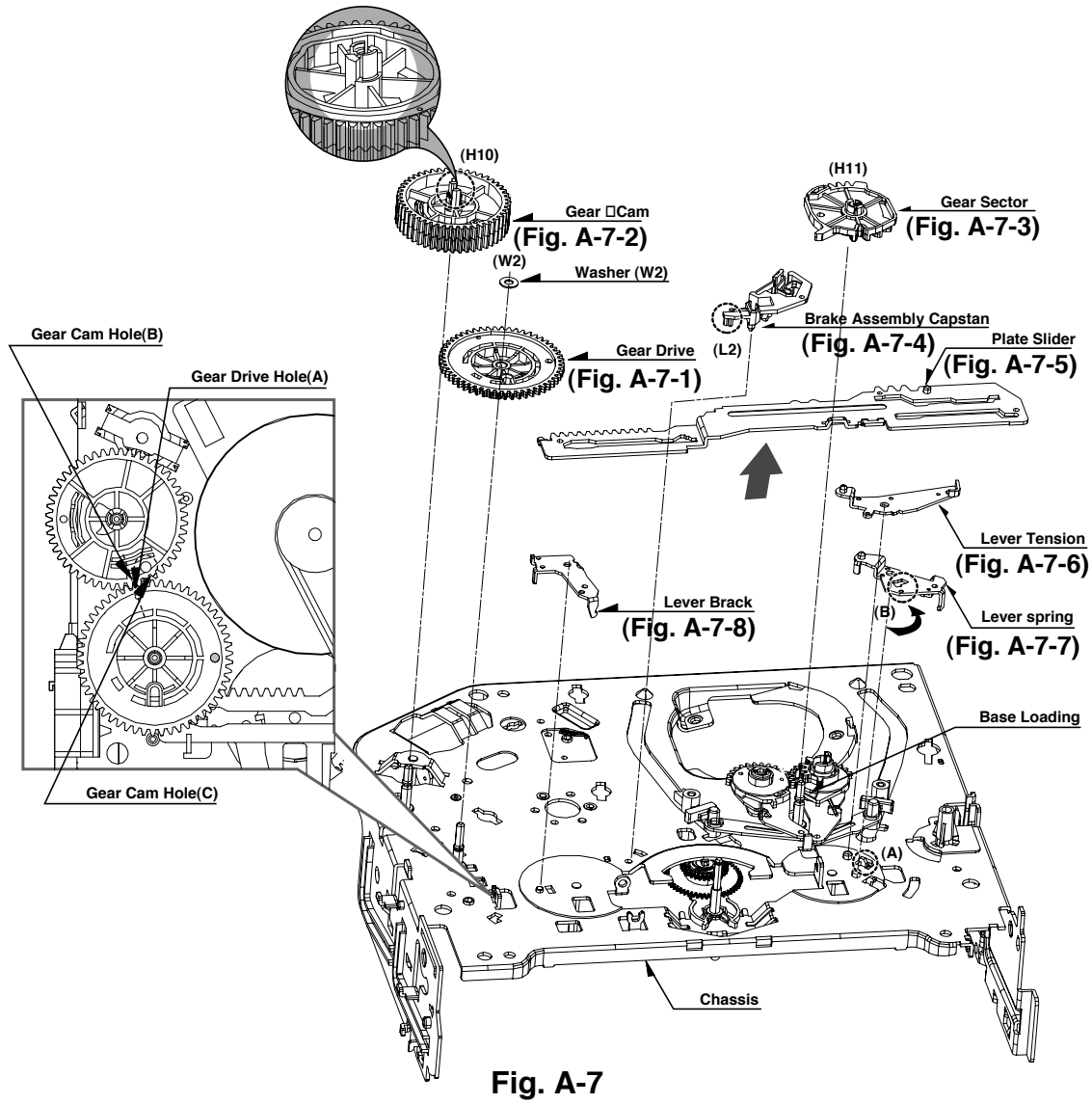


Fig. A-7

24. Gear Drive (Fig. A-7-1)/ Gear Cam (Fig. A-7-2)

1) Remove the washer (W2) and then disassemble the gear drive.
2) Release the hook (H10) of the gear cam and then disassemble it upward.

CAUTIONS

For the assembly, adjust both the gear driver hole (A) and the gear cam hole (B) straightly and then correspond the gear cam hole (C) to the chassis hole.

25. Gear Sector (Fig. A-7-3)

1) Release the hook (H11) of the gear sector and then hold the gear sector upward.

26. Brake Assembly Capstan (Fig. A-7-4)

1) Release the locking tab (L2) on the bottom side of the plate slider and then disassemble it upward.

27. Plate Slider (Fig. A-7-5)

1) Disassemble the plate slider while holding it up.

28. Lever Tension (Fig. A-7-6)

1) Release the lever tension from the guide (A) of chassis while turning it anti-clockwise.
2) Disassemble the lever tension while holding it up.

29. Lever Spring (Fig. A-7-7)

1) Release the (B) part of the lever spring from the guide (A) of chassis while turning it anti-clockwise.
2) Disassemble the lever tension while holding it up.

30. Lever Brake (Fig. A-7-8)

1) Disassemble the lever brake while holding it up.

DECK MECHANISM DISASSEMBLY

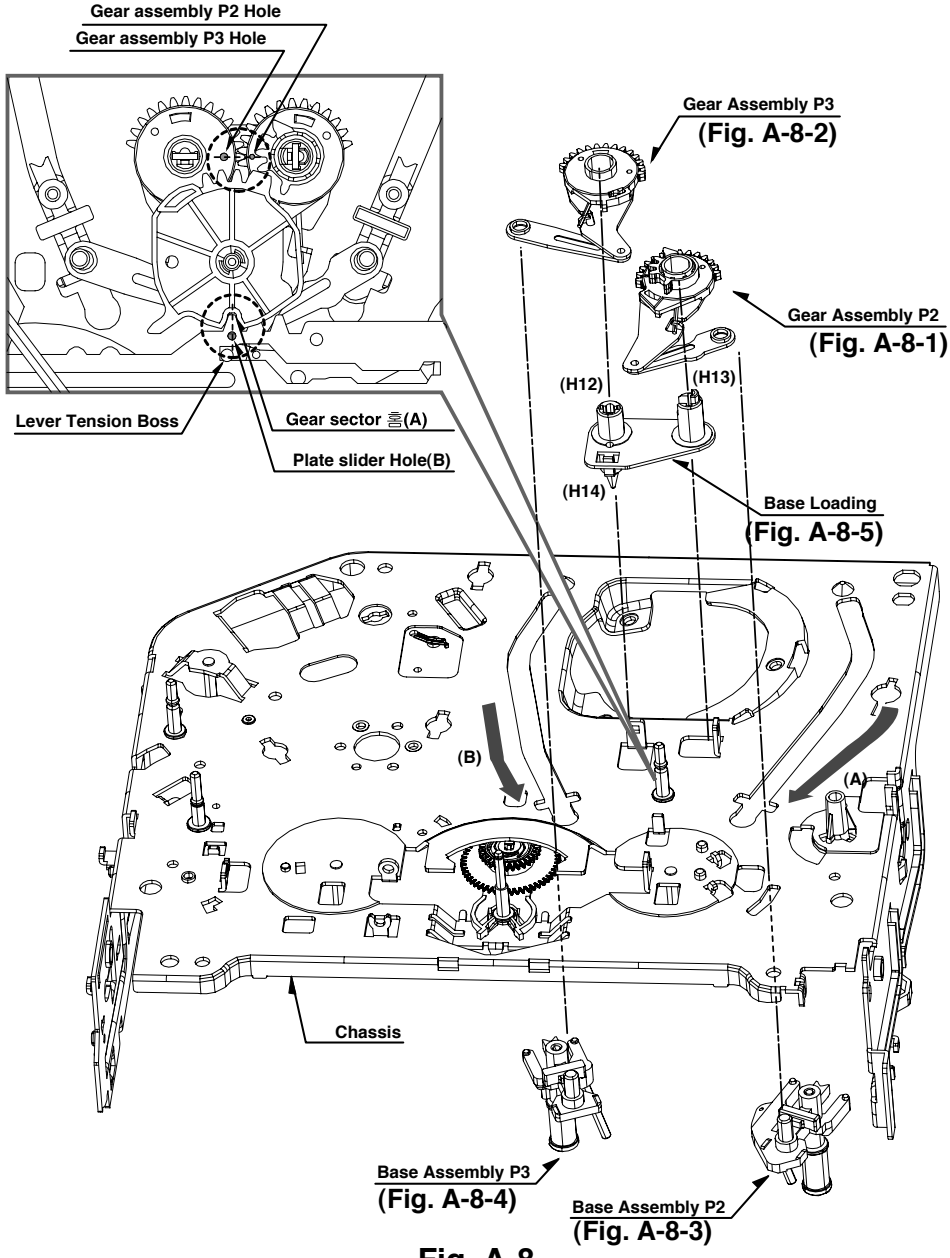


Fig. A-8

31. Gear Assembly P2 (Fig. A-8-1)/ Gear Assembly P3 (Fig. A-8-2)

1) Hold the gear assembly P2 upward.
2) Hold the gear assembly P3 upward.

CAUTIONS

For the assembly, check the holes of both the gear assembly P2 and the P3 are adjusted straightly, and then correspond the gear section groove (A) to the plate slider hole (B).

32. Base Assembly P2 (Fig. A-8-3)/ Base Assembly P3 (Fig. A-8-4)

1) Disassemble the base assembly P2 downward while moving it toward the arrow (A) direction along with the guide hole of chassis.
2) Disassemble the base assembly P2 downward while moving it toward the arrow (B) direction along with the guide hole of chassis.

33. Base Loading (Fig. A-8-5)

1) Release 3 hooks (H12, 13, 14) of the base loading, and then disassemble them upward.
   - Reverse the mechanism.

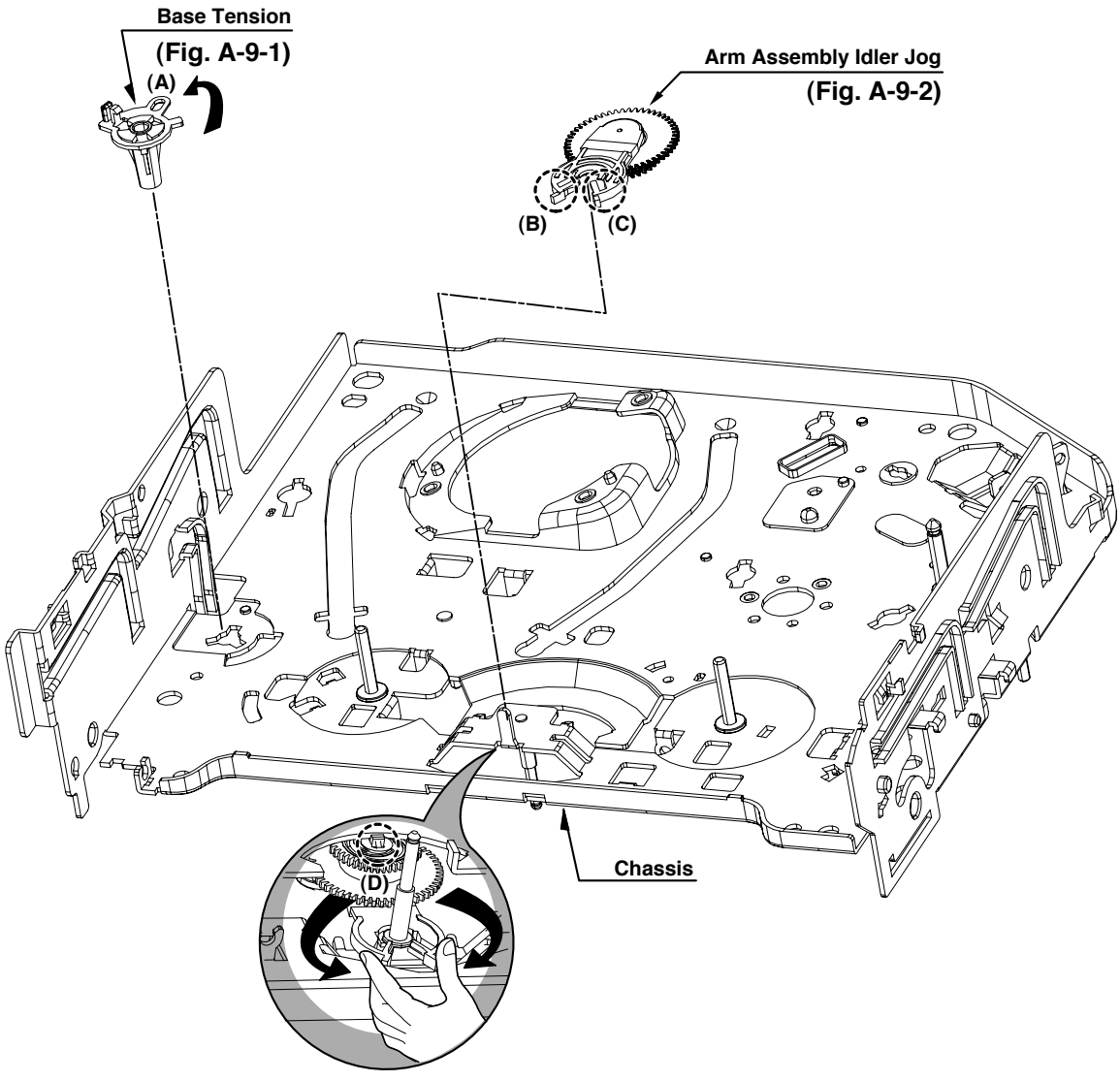


Fig. A-9

34. Base Tension (Fig. A-9-1)

1) Release the (A) part of the base tension from the embossing of chassis.
2) Hold the base tension upward while turning it anti-clockwise.

35. Arm assembly Idler Jog (Fig. A-9-2)

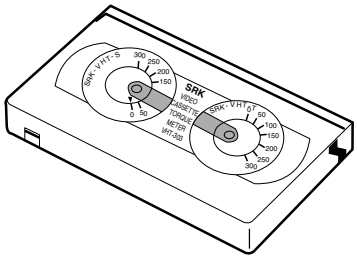
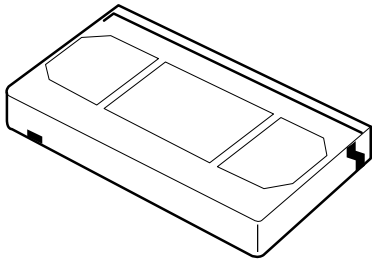
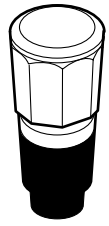
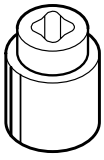
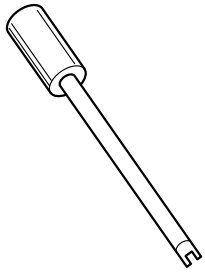
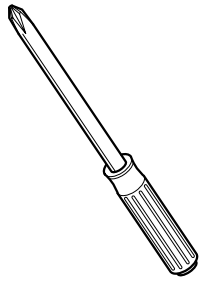
1) Push both (B), (C) parts in Fig. A-9-2 toward the arrow direction.
2) Disassemble the arm assembly idler upward.

CAUTIONS

Take care to ensure that the (D) part in the drawing is not hung to chassis in disassembly.

DECK MECHANISM ADJUSTMENT

• Fixtures and Tools for Service

1. Cassette Torque Meter **SRK-VHT-303(Not SVC part)** **Part No:D00-D006** 	**2. Alignment tape** **Part No NTSC:DTN-0001** **PAL:DTN-0002** 	**3. Torque gauge** **600g.Cm ATG** **Part No:D00-D002** 
4. Torque gauge adaptor **Part No:D09-R001** 	**5. Post height adjusting driver** **Part No:DTL-0005** 	**6. + Type driver (ø5)** 

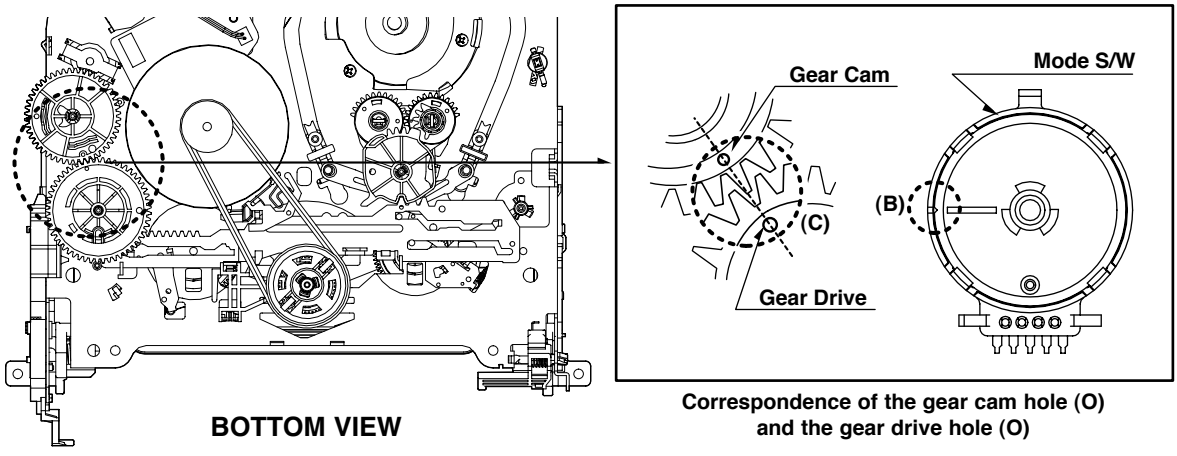
DECK MECHANISM ADJUSTMENT

1. Mechanism Assembly Mode Check

Purpose of adjustment : To make tools normally operate by positioning tools accurately.		
Fixtures and tools used	**VCR (VCP) status**	**Checking Position**
• Blank Tape (empty tape)	• Eject Mode (with cassette withdrawn)	• Mechanism and Mode Switch

1) Turn the VCR on and take the tape out by pressing the eject button.
2) Separate both top cover and plate top, and check both the hole (A) of gear cam and the hole (A') of chassis correspond (Fig. C-2).
3) If it is done as in the paragraph 2): Turn the gear cam as in No.2) after mantling the motor assembly L/D.
4) Undo the screw fixing the deck and the main frame, and separate the deck assembly. Check both the hole (A) of gear cam and the hole (A') of chassis correspond (Fig. C-1).
5) Check the mode S/W on the main P.C. board locates at a proper position as in (B) of the Fig. (C-1).
6) Connect the deck to the main P.C. board and perform all types of test.

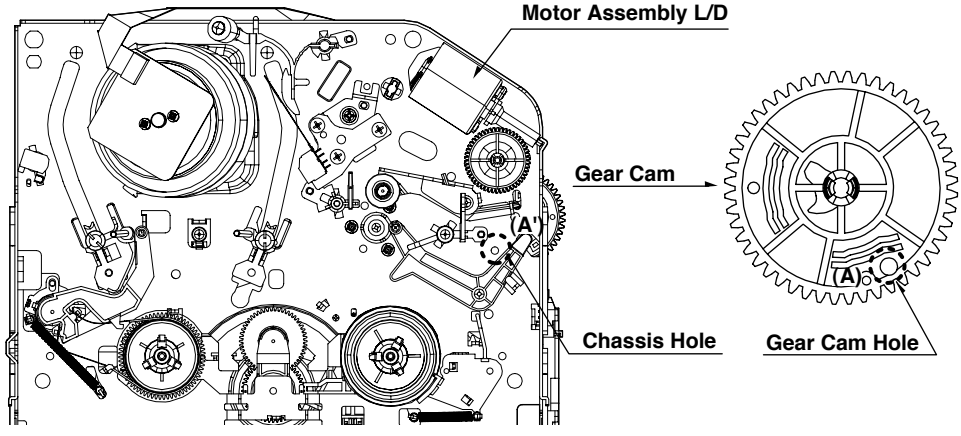
CHECK DIAGRAM



BOTTOM VIEW

Correspondence of the gear cam hole (O) and the gear drive hole (O)

Fig. C-1



TOP VIEW

Fig. C-2

DECK MECHANISM ADJUSTMENT

2. Previous Preparation for Deck Adjustment

(Preparation to load the VCR (VCP) with cassette tape not inserted)

1) Take the power cord from the consent.
2) Separate the top cover and the plate assembly top.
3) Insert the power cord into again.
4) Turn the VCR (VCP) on and load the cassette while pushing the lever stopper of the holder assembly CST backward. In this case, clog both holes on the housing rail part of chassis to prevent detection of the end sensor.

If doing so, proceeding to the stop mode is done. In this status, input signals of all modes can be received. However, operation of the Rewind and the Review is impossible since the take-up reel remains at stop status and so cannot detect the reel pulse (however, possible for several seconds).

3. Torque Measuring

Purpose of Measuring : To measure and check the reel torque on the take-up part and the supply part that performs basic operation of the VCR (VCP) for smoothly forwarding the tape.
Measure and check followings when the tape is not smoothly wound or the tape velocity is abnormally proceeded:

Fixtures and tools used	VCR (VCP) status	Measuring method
• Torque Gauge (600 g.cm ATG) • Torque Gauge Adaptor • Cassette Torque Meter SRK-VHT-303	• Play (FF) or Review (REW) Mode	• Try to operate the VCR (VCP) per mode with the tape not inserted (See '2. Prior Preparation for Deck Adjustment). • Measure after adhering and fixing the torque gauge adaptor to the torque gauge (Fig. C-3-1) • Read scale of the supply or take-up part of the cassette torque meter (Fig. C-3-2).

Item	Mode	Instruments	Reel Measured	Measuring Value
Fast forward Torque	Fast Forward	Torque Gauge	Take-Up Reel	More than 400g°cm
Rewind Torque	Rewind	Torque Gauge	Supply Reel	More than 400g°cm
Play Take-Up Torque	Play	VHT-303	Take-Up Reel	40~100g°cm
Review Torque	Review	VHT-303	Supply Reel	120~210g°cm

NOTE

Adhere the torque gauge adaptor to the torque gauge for measuring the value.

• Torque Gauge (600g.cm ATG)

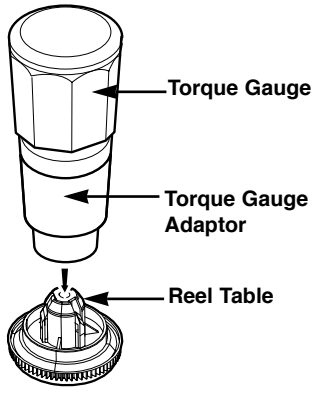


Fig. C-3-1

• Cassette Torque Meter (SRK-VHT-303)

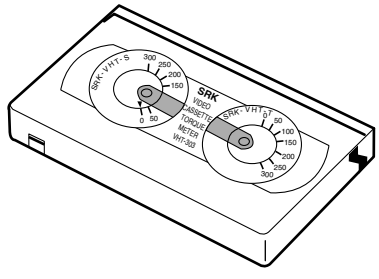


Fig. C-3-2

DECK MECHANISM ADJUSTMENT

4. Guide Roller Height Adjustment

Purpose of adjustment : To ensure that the bottom surface of the tape can travel along with the tape lead line of the lower drum by constantly and adjusting and maintaining the height of the tape.

4-1. Prior Adjustment

Fixtures and tools used	VCR (VCP) status	Adjustment position
• Post Height Adjusting Driver	• Play or Review Mode	• The guide roller height adjusting screw on the supply guide roller and the take-up guide roller

Adjustment Procedure

1) Travel the tape and check the bottom surface of the tape travels along with the guide line of the lower drum.
2) If the tape travels toward the lower part of guide line on the lower drum, turn the guide roller height adjusting screw to the left
3) If it travels to the upper part, turn it to the right.
4) Adjust the height of the guide roller to ensure that the tape is guided on the guide line of the lower drum at the inlet/outlet of the drum. (Fig. C-4-1)

ADJUSTMENT DIAGRAM

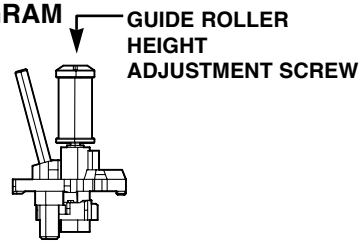


Fig. C-4-1

4-2. Fine Adjustment

Fixtures and tools used	Measuring tools and connection position	VCR (VCP) status	Adjustment position
• Oscilloscope • Standard test tape • Post height adjusting driver	• CH-1: PB RF Envelope • CH-2: NTSC : SW 30Hz PAL : SW 25Hz • Head switching output point • RF Envelope output point	• Play the standard test tape.	• Guide roller height adjusting screw

1) Play the standard test tape after connecting the probe of oscilloscope to the RF envelope output point and the head switching output point.
2) Tracking control (playback) : Locate it at the center (Set the RF output to the maximum value via the tracking control when such adjustment is completed after the drum assembly is replaced.)
3) Height adjusting screw: Flatten the RF waveform. (Fig. C-4-2)
4) Move the tracking control (playback) to the right/left. (Fig. C-4-3)
5) Check the start and the end of the RF output reduction width are constant.

CAUTIONS

There must exist no crumpling and folding of the tape due to excess adjustment or insufficient adjustment.

Waveform

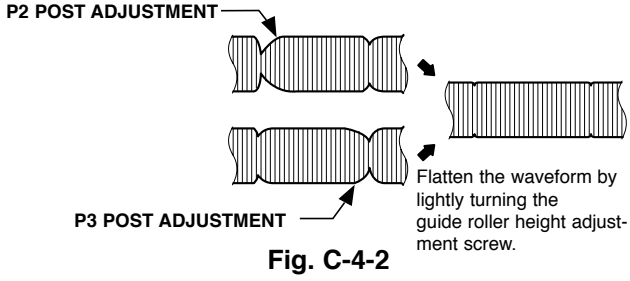

P2 POST ADJUSTMENT
P3 POST ADJUSTMENT
Flatten the waveform by lightly turning the guide roller height adjustment screw.

Fig. C-4-2

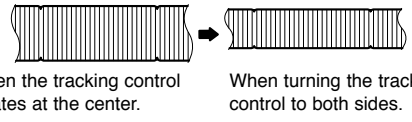
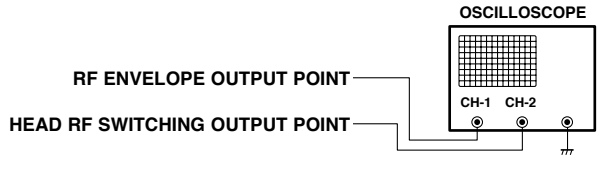


Fig. C-4-2

Connection Diagram



DECK MECHANISM ADJUSTMENT

5. Audio/Control (A/C) Head Adjustment

Purpose of adjustment : To ensure that audio and control signals can be recorded and played according to the contract tract by constantly maintaining distance between tape and head, and tape tension between the P3 post and the P4 post.

5-1. Prior Adjustment (performed only when no audio output appears in play of the standard test tape)

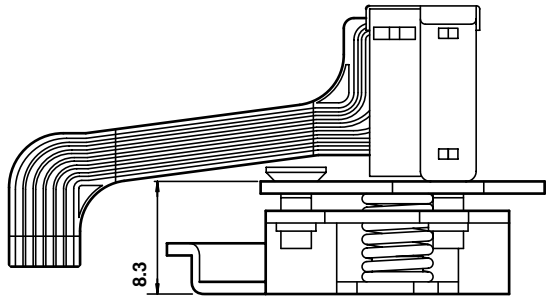
Fixtures and tools used	VCR (VCP) status	Adjustment position
• Blank Tape (Empty Tape) • Driver (+) Type ø 5	• Play the blank tape (empty tape).	• Tilt adjusting screw (C) • Height adjusting screw (B) • Azimuth adjusting screw (A)

Adjustment Procedure/Adjustment Diagrams

1) Basically use the A/C head assembly adjusted as in SPEC.
2) Check there is crumpling and folding of the tape around the A/C head. If it is, Turn and adjust the tilt adjusting screw to ensure that the tape corresponds to the bottom guide of the P4, and recheck the tape path after proceeding play for 4-5 seconds.
3) Where the tape bottom is not equal to Fig. C-5-3, Adjust the height by using the height adjusting screw (B) and then readjust it by using the tilt adjusting screw (C).

CAUTIONS

Always check the height of the A/C head since most ideal height of A/C head can be obtained when the bottom part of the tape is away 0.2 ~ 0.25mm from the bottom part of the A/C head.



A/C Head Base

Fig. C-5-1

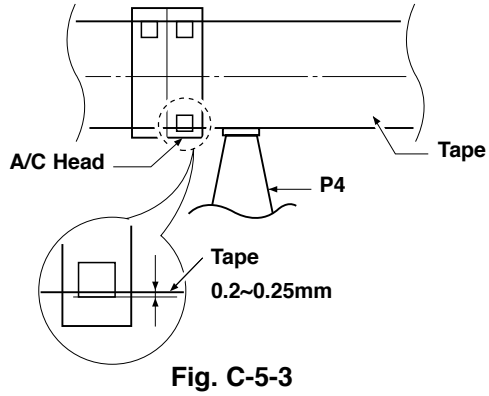
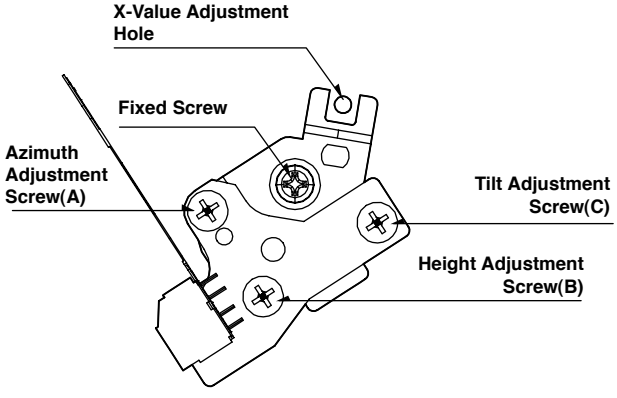


Fig. C-5-3



A/C Head Assembly

Fig. C-5-2

5-2. Tape Path Check between Pinch Roller and Take up Guide (Check in the Rev Mode)

1) Check the tape pass status between the pinch roller and the take-up guide.(Check there is crumpling of the tape pass and folding of the take-up guide.)
   (1) When holding of the take-up guide bottom occurs Turn the tilt adjusting screw (C) clockwise and travel it stably to ensure there is no crumbling or folding of the tape.
   (2) When holding of the take-up guide top occurs Turn the tilt adjusting screw (C) anti-clockwise and travel it stably to ensure there is no crumbling or folding of the tape.

2) Check there is folding of the tape at the bottom or top of the take-up guide in cutting-off the REV mode

CAUTIONS

If the RF waveform is changed after adjusting the A/C head, perform fine adjustment to ensure the RF waveform is flattened.

5-3. Fine Adjustment (Azimuth Adjustment)

Fixtures and tools used	Connection position	VCR (VCP) status	Adjustment position
• Oscilloscope • Standard test tape (only for SP) • Driver (+) Type Ø 4	• Audio Output Jack	• Play the standard test • Tape, 1KHz, 7KHz.	• Azimuth Adjusting Screw (A) • Height Adjusting Screw (B)

Adjustment Procedure

1) Connect the probe of Oscilloscope to the audio output jack.
2) Ensure that Audio 1KHz, 7KHz output is flattened at the maximization point by adjusting the Azimuth adjusting screw (A).

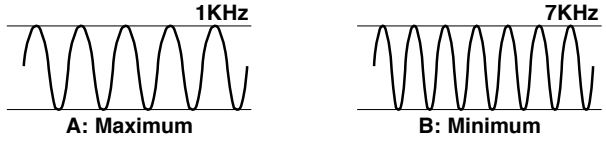
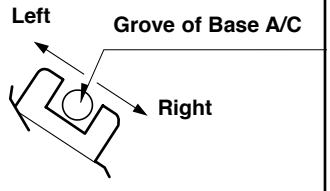


Fig. C-5-4

6. X-distance Adjustment

Purpose of adjustment : To maintain compatibility with other VCR (VCP).

Fixtures and tools used	Connection position	VCR (VCP) status	Adjustment position
• Oscilloscope • Standard test tape (only for SP) • Driver (+) Type Ø 4	• CH-1: PB RF Envelope • CH-2: NTSC ; SW 30Hz PAL:SW 25Hz • Head switching output point • RF Envelope output point	• Play the standard test tape.	

Adjustment Procedure

1) After releasing the auto tracking, lightly turn the fixing screw. Turn the (+) type driver (Ø 3 ~ Ø 4) on the X-distance adjusting hole to the right or left. Adjust the RF envelope level to the maximum point and then fix the fixing screws.
2) For the 31mm head, adjust it with the SP tape recorded in the width of 31mm since the head travels on the tape track only for SP with the width of 58mm.

Connection Diagram

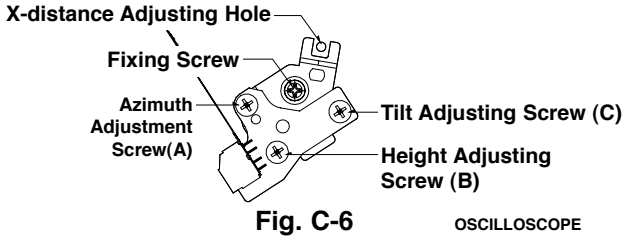
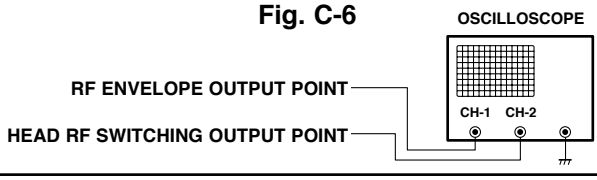


Fig. C-6



DECK MECHANISM ADJUSTMENT

7. Adjustment after Drum Assembly (Video Heads)

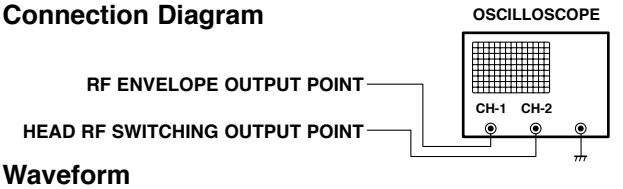
Purpose of adjustment : To adjust and stabilize the height change, X-distance change, etc depending on the guide roller after assembling the drum.

Fixtures and tools used	Connection position	VCR (VCP) status	Adjustment position
• Oscilloscope • Standard test tape (only for SP) • Post Height Adjusting Driver • Driver (+) Type Ø 5	• CH-1: PB RF Envelope • CH-2: NTSC : SW 30Hz PAL:SW 25Hz • Head switching output point • RF Envelope output point	• Play the blank tape. • Play the standard test tape.	• Fine adjustment of guide roller • Switching Point • Tracking Preset • X-distance

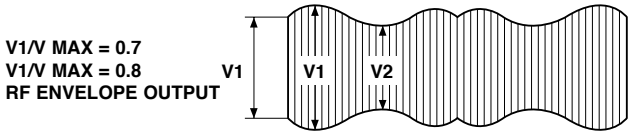
Checking/Adjustment Procedure

1) Play the blank tape (empty tape) and check whether the guide roller crumbles or wrinkles the tape and adjust it if necessary.
2) Check that the RF envelope output waveform is flat, and adjust the height of the guide roller while playing the standard test tape.
3) Adjust the switching point.
4) Check the RF envelope output is the maximum when the tracking control locates at the center. If not maximum, set up to ensure that RF envelope output becomes the maximum by turning the (+) type driver (Ø 3 ~ Ø 4) on the base A/C groove.

Connection Diagram



Waveform



8. Check of Traveling Device after Deck Assembly

8-1. Audio, RF Normalization Time (Locking Time) Check in Play after CUE or REV

Fixtures and tools used	Measuring standard	Connection position	VCR (VCP) status
• Oscilloscope • 6H 3KHz Color Bar Standard Test tape • Stop Watch	• RF Locking Time: Within 5 seconds • Audio Locking Time : Within 10 seconds	• CH-1: PB RF Envelope • CH-2: Audio output • RF Envelope output point • Audio output jack	• Play the 6H 3KHz Color Bar Standard Test tape.

Checking Procedure

1) Check that locking time of the RF and Audio waveform is fallen within the measuring standard in conversion of the play mode from the CUE or the REV mode.
2) Readjust the paragraph 5 and 6 if it deviates from the standard.

8-2. Check of Tape Curl and Jam Status

Fixtures and tools used	Fixtures and tools used	Fixtures and tools used
• T-160 Tape • T-120 Tape	• There must be no jam or curl at the first, middle and end position of tape.	• Travel the tape at the position of its first and end.

Checking Procedure

1) Check there is no abnormality of every traveling post status.
2) There must be no abnormal operation of the counter in occurrence of folding of the bottom tape. There must be not abnormality of audio signal in damage of the top tape.
3) If there is abnormality, readjust the adjustment paragraph 4 and 5.

1. Checking Points prior to Repair

Following abnormal phenomena may be repaired by removal of foreign materials and oil supply. Check oiling is required at the checking set or cleaning status is complete. Determine that necessity of checking and repair the set exists after checking the using period of the set together with the user. In this case, followings must be checked:

Phenomena	Checking Points and Cause	Replace-ment
Color beat	Pollution of Full-Erase Head	o
S/N, Color Faded	Pollution of Video Head	o
Horizontal, Vertical Jitte	Pollution of Video Head or Tape Transport System	o
Poor Sound, Low Sound	Pollution of Audio/Control Head	o
No tape wound or tape wound loosely. FF or REW impossible, or slow turning	Pollution of Pinch Roller or Belt Capstan Belt	o
Tape loosely wound in REV or Unloading	Deterioration of Clutch Assembly D37 Torque	o
	Pollution of Drum and Traveling Device	Fig. C-9-3

CAUTIONS

If operation of the position with (O) mark is abnormal even after removing cause, replace it with substitute product since it shows damage or wearing.

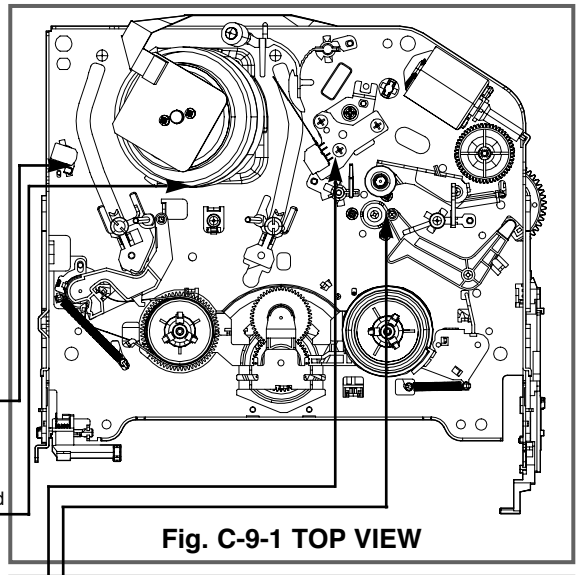


Fig. C-9-1 TOP VIEW

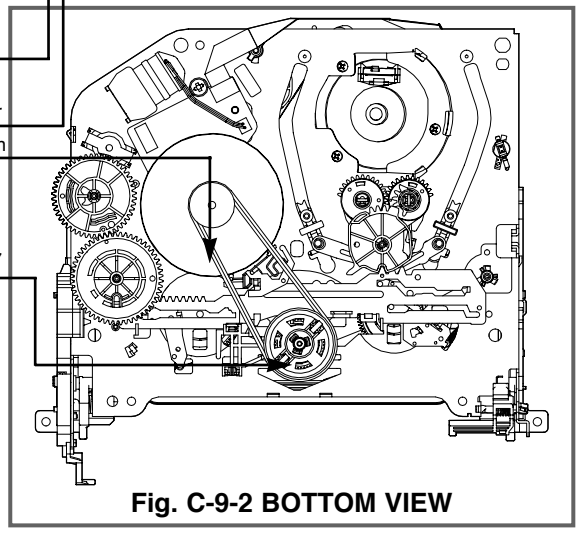


Fig. C-9-2 BOTTOM VIEW

*** No. (1) ~ (12) shows sequence that the tape moves from the supply reel to the take-up reel.)**

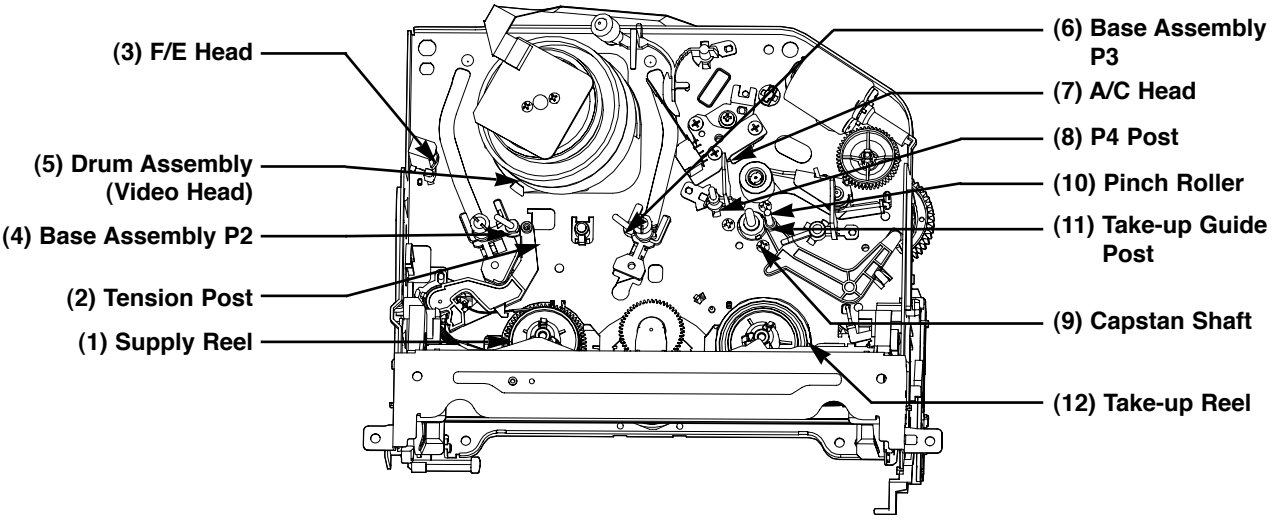


Fig. C-9-3 Tape Transport System

2. Essential Check and Repair

Recording density of the video is far higher than the audio. Therefore video parts are very precise so as to allow only error of 1/1000mm or so in order to maintain compatibility with other videos.
If one of these parts is polluted or old, same phenomena will appear as they are damaged.
To maintain clear screen, regular check, replacement of old and damaged parts and oil supply, etc are essential.

3. Regular Check and Repair

Check and repair schedule is not constant since they vary depending on method that the consumer uses video and environment where the video is installed at.
However, for the video used by common household, good screen will be maintained if regular check and repair per 1,000 hour is performed. The following chart shows relationship between using time and checking time:

Table 1

Time Requiring Checking / Average hours used per day	About 1 year	About 18 months	About 3 years
One hour	■	■	■
Two hours	■	■	
Three hours	■		

4. Tools for Check and Repair

(1) Grease: Floil G-3114 (KANTO) or equivalent grease (Green)
(2) Grease: Kanto G-754, PL-433 (Yellow)
(3) Alcohol (Isopropyl Alcohol)
(4) Cleaning Patch (cloth)

5. Maintenance Process

5-1) Removal of Foreign Material

(1) Removal of foreign material from video head (Fig. C-9-4)
Firstly try to use a cleaning tape.
Use a cleaning patch if foreign materials are not removed with the cleaning tape due to severe dirty of the head. Soak the cleaning patch in alcohol and put it to the head tip. Smoothly turn the drum (turning cylinder) to the right or left (In this case, the cleaning patch must not be moved vertically).
After completely drying the head, test the traveling status of the tape.
If alcohol (Isopropyl Alcohol) remains at the video head, the tape may be damaged when this solution touches with the head surface.

Never use a cloth bar (commercial sale)

(2) Wipe the tape transport system and the drive system with the cleaning patch soaked in alcohol (Isopropyl Alcohol) when removing foreign materials from them.
1) The part touched with the traveling tape is called as tape transport system. The drive system consists of parts to travel the tape.
2) Care must be exercised so that unreasonable force to change the pattern will be applied to the tape transport system during removal of foreign materials.

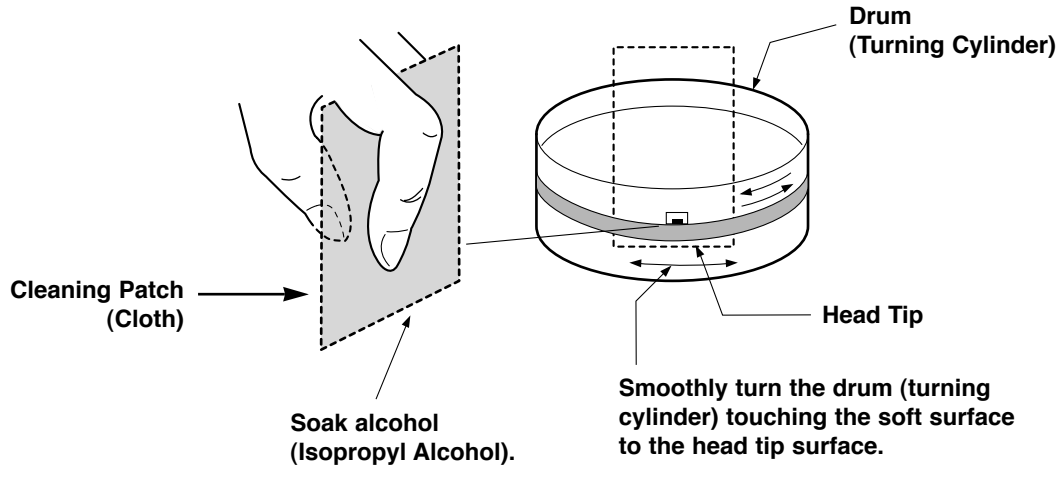


Fig. C-9-4

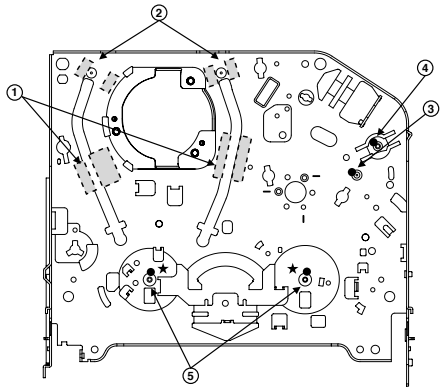
5-2) Grease Applications

(1) Grease Application Method

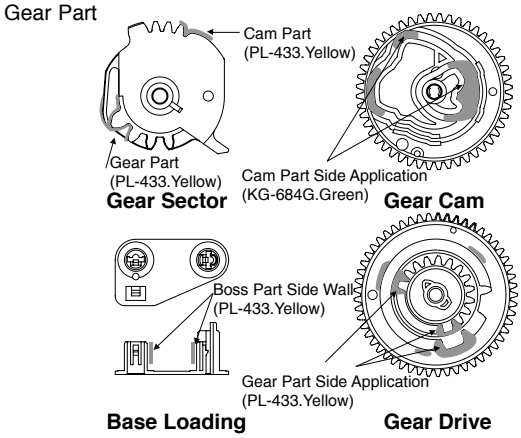
Apply grease by using a cloth swab or brush. Care must be exercised so that excess quantity should not be used. If the excessive quantity is applied, wipe it with the gauze soaked in alcohol (Isopropyl Alcohol).

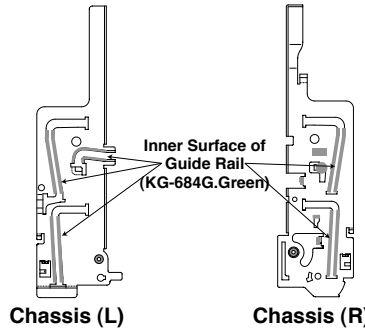
NOTE: POSITION OF GREASE APPLICATION

(1) Inner Side Surface and Top Surface of Loading Path
(2) Stable Adhesion Part of Base P2, P3
(3) Arm Pinch Shaft
(4) Gear Wheel Shaft
(5) Reel S. T. Shaft
(1) (2) (3) (4): KG-684G (Green)
(5): PL-433 (Yellow)



Chassis (TOP)

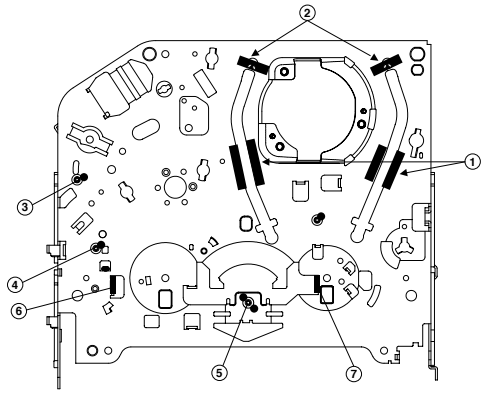




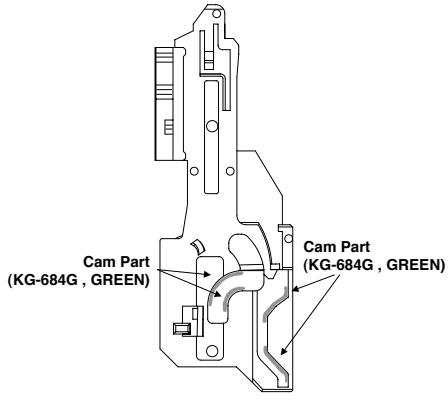
(2) Regular Grease Application

Apply grease to the designated application position every 500 hour.

(1) Inner Side Surface and Top Surface of Loading Path
(2) Stable Adhesion Part of Base P2, P3 Coil
(3) Gear Cam Shaft
(4) Gear Drive Shaft
(5) Clutch Shaft Groove
(6) Guide Part on the Plate Slider Side Wall (Left)
(7) Guide Part on the Plate Slider Side Wall (Right)
(1) (2) (3) (4) (5) (6) (7): KG-684G (Green)



Chassis (Bottom)



Gear Rack F/L

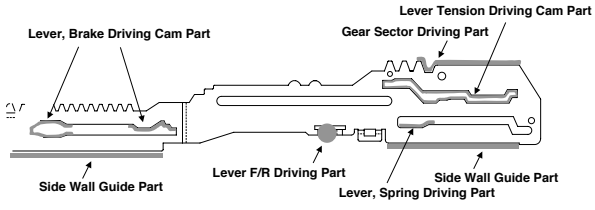
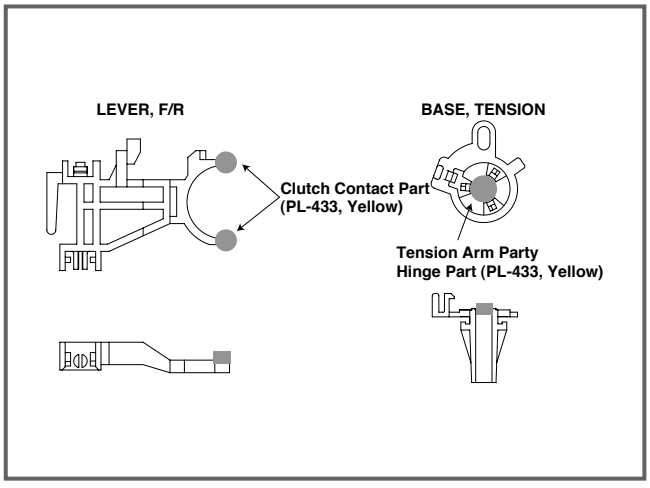
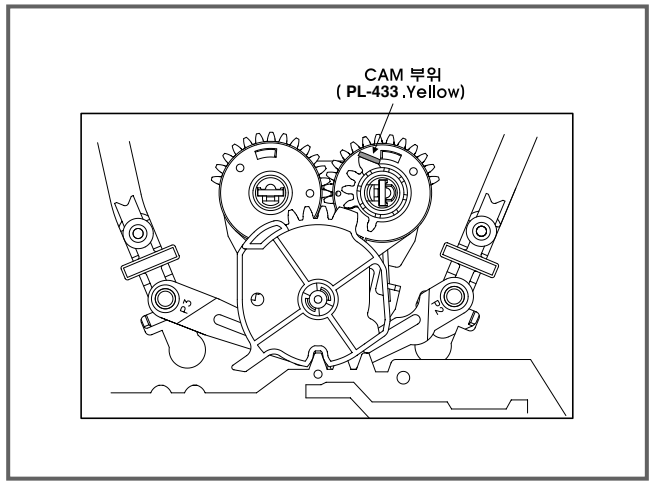

Lever, Brake Driving Cam Part
Lever Tension Driving Cam Part
Gear Sector Driving Part
Side Wall Guide Part
Lever F/R Driving Part
Side Wall Guide Part
Lever, Spring Driving Part

Plate Slider

Lever, F/R, Base, Tension



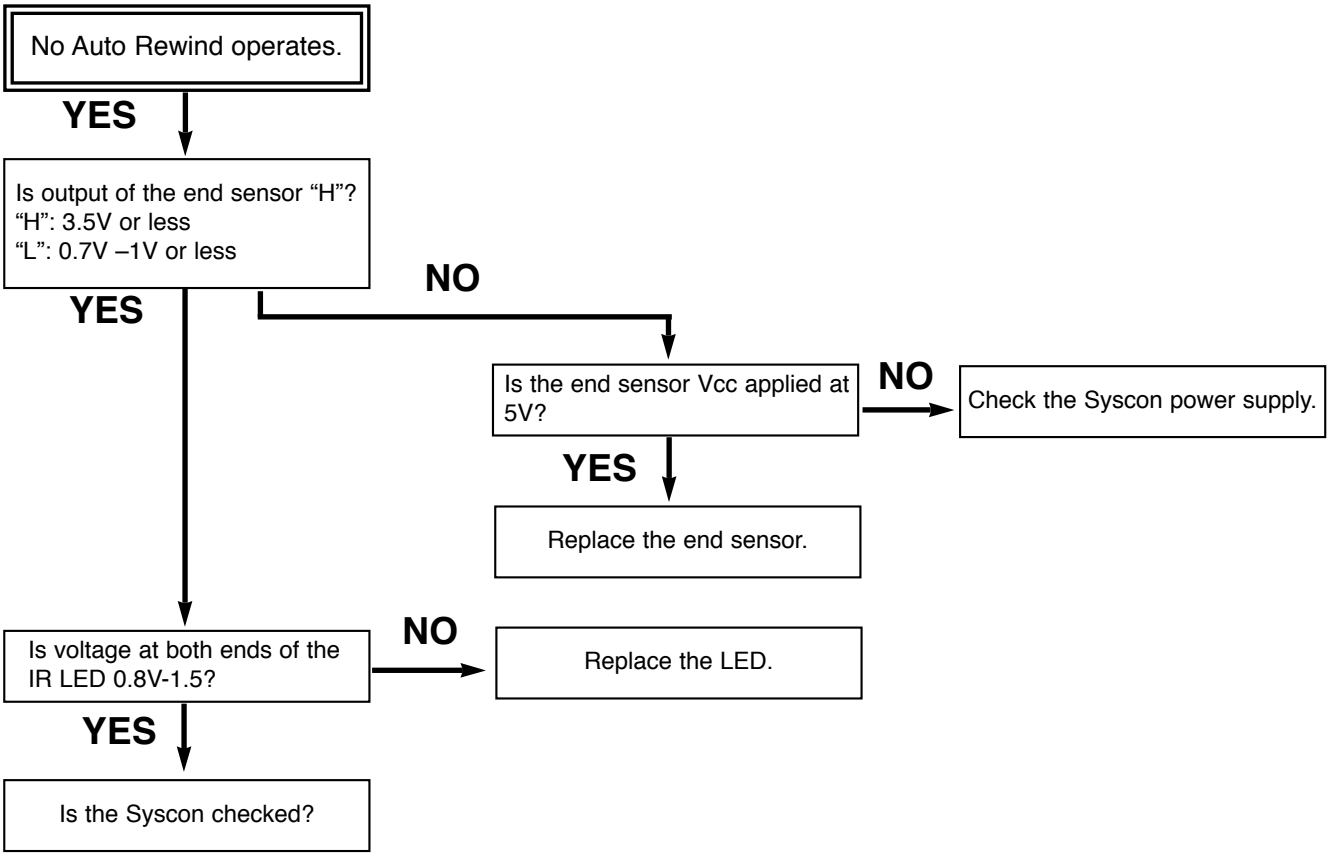
GEAR AY, P2 & P3



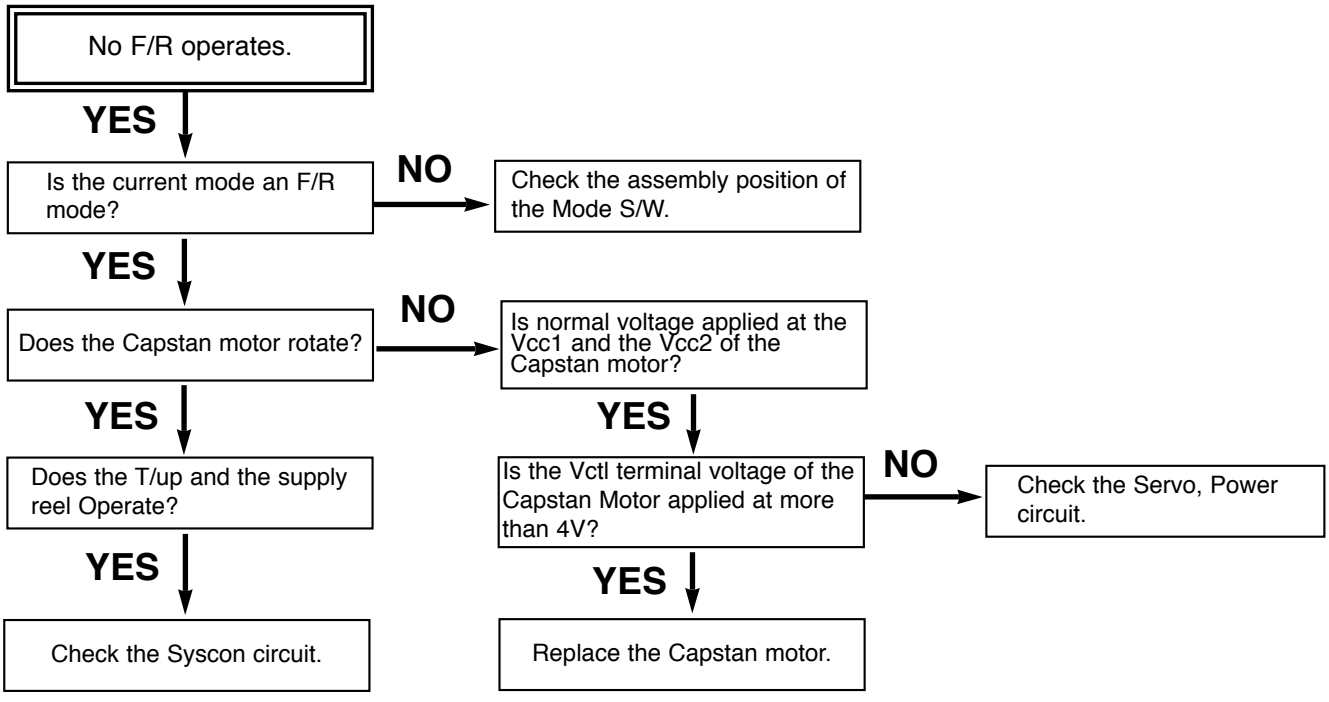
MECHANISM TROUBLESHOOTING GUIDE

1.Deck Mechanism

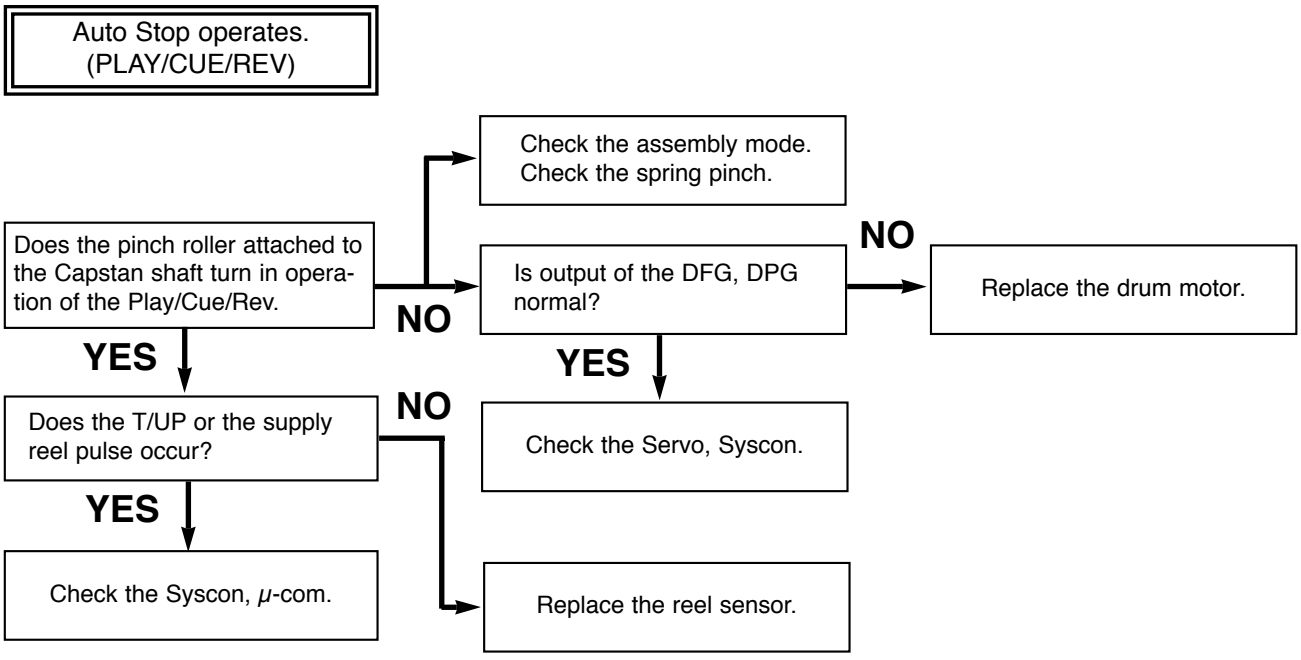
A.



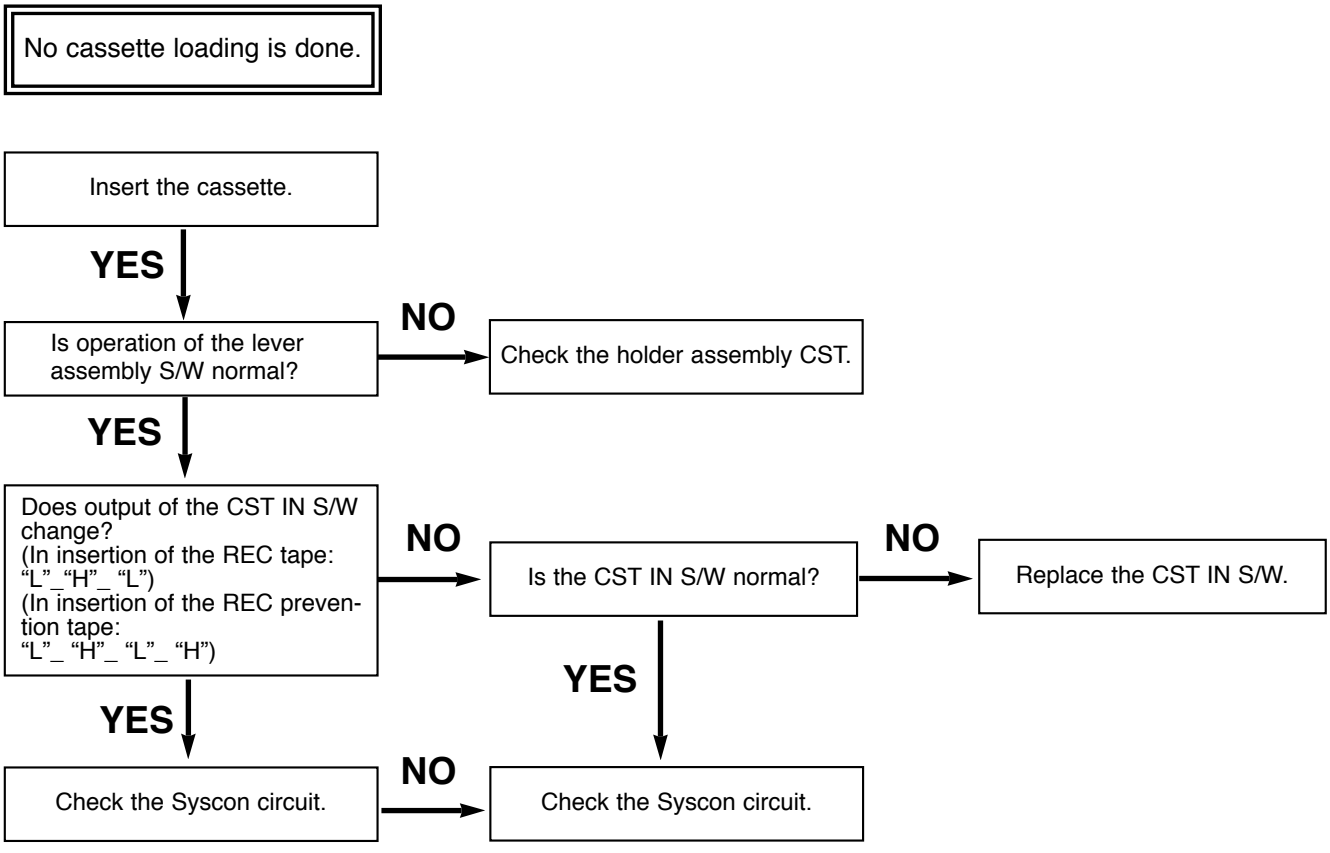
B.


No F/R operates.
YES
Is the current mode an F/R mode?
NO
Check the assembly position of the Mode S/W.
YES
Does the Capstan motor rotate?
NO
Is normal voltage applied at the Vcc1 and the Vcc2 of the Capstan motor?
YES
YES
Does the T/up and the supply reel Operate?
Is the Vctl terminal voltage of the Capstan Motor applied at more than 4V?
NO
Check the Servo, Power circuit.
YES
YES
Check the Syscon circuit.
Replace the Capstan motor.

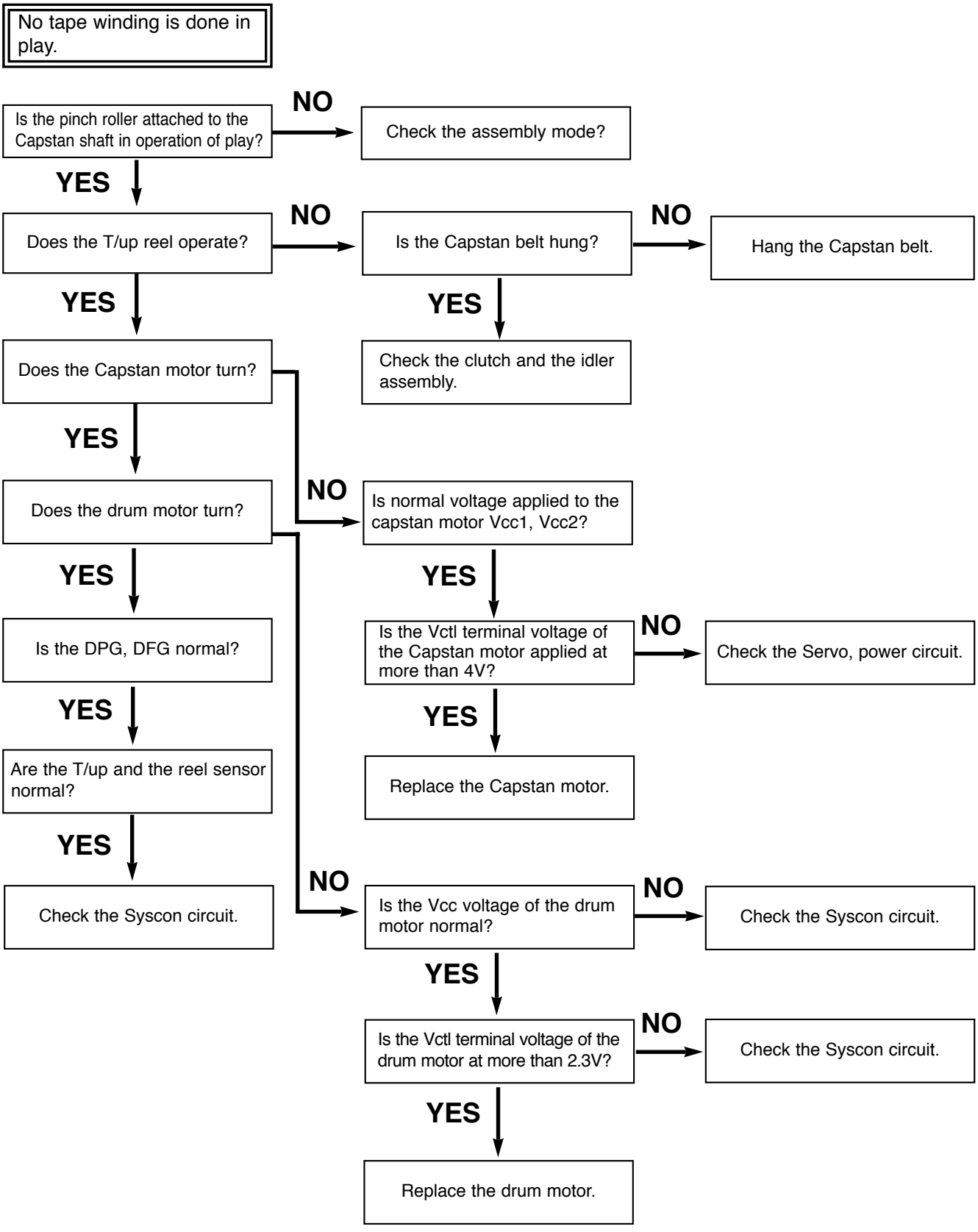
C.


Auto Stop operates.
(PLAY/CUE/REV)
Does the pinch roller attached to the Capstan shaft turn in operation of the Play/Cue/Rev.
NO
Check the assembly mode.
Check the spring pinch.
Is output of the DFG, DPG normal?
NO
Replace the drum motor.
YES
YES
Does the T/UP or the supply reel pulse occur?
NO
Check the Servo, Syscon.
YES
Check the Syscon, μ-com.
Replace the reel sensor.

D.

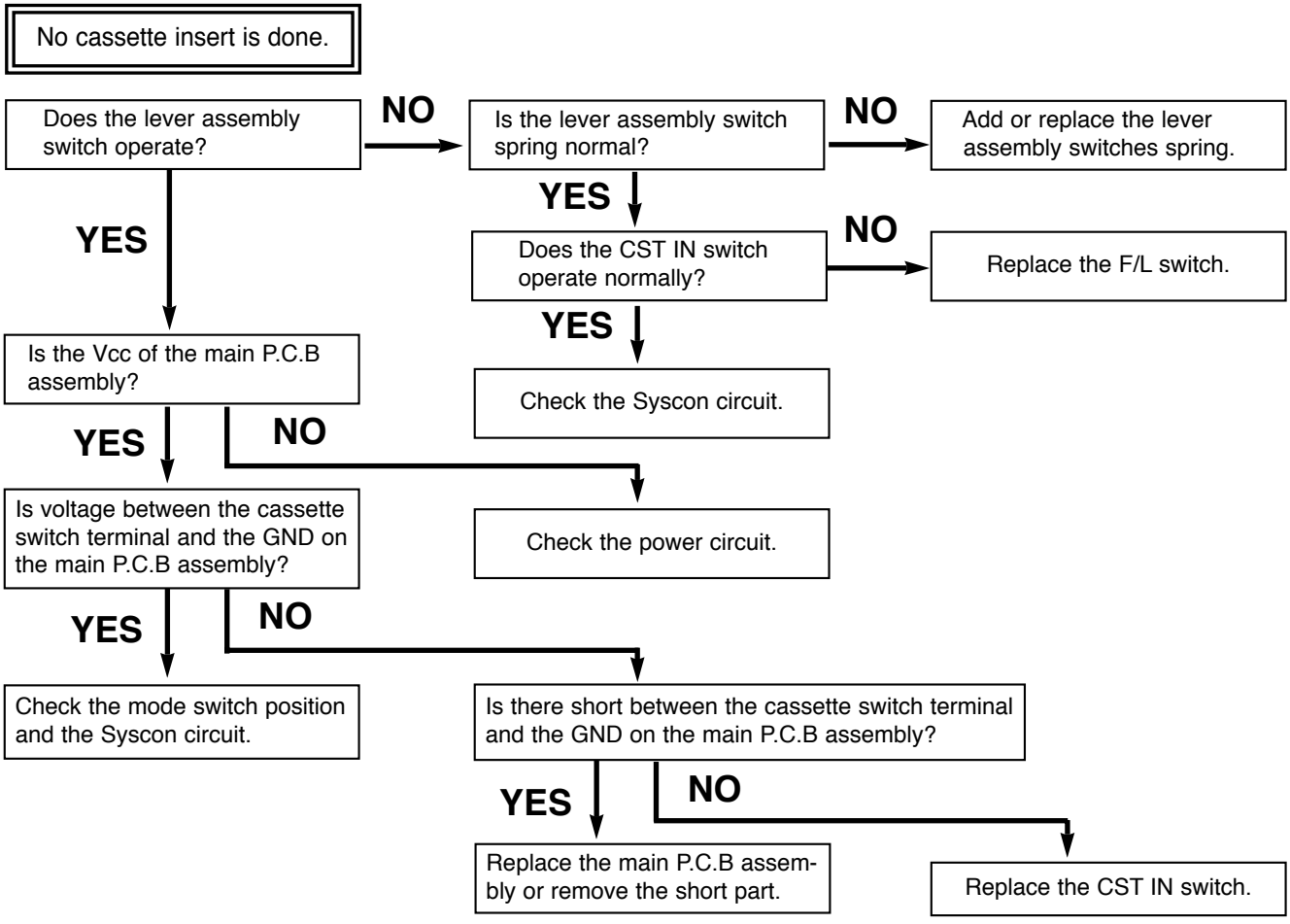

No cassette loading is done.
Insert the cassette.
YES
Is operation of the lever assembly S/W normal?
NO
Check the holder assembly CST.
YES
Does output of the CST IN S/W change?
(In insertion of the REC tape:
"L"_"H"_ "L")
(In insertion of the REC prevention tape:
"L"_ "H"_ "L"_ "H")
NO
Is the CST IN S/W normal?
NO
Replace the CST IN S/W.
YES
YES
Check the Syscon circuit.
NO
Check the Syscon circuit.

E.

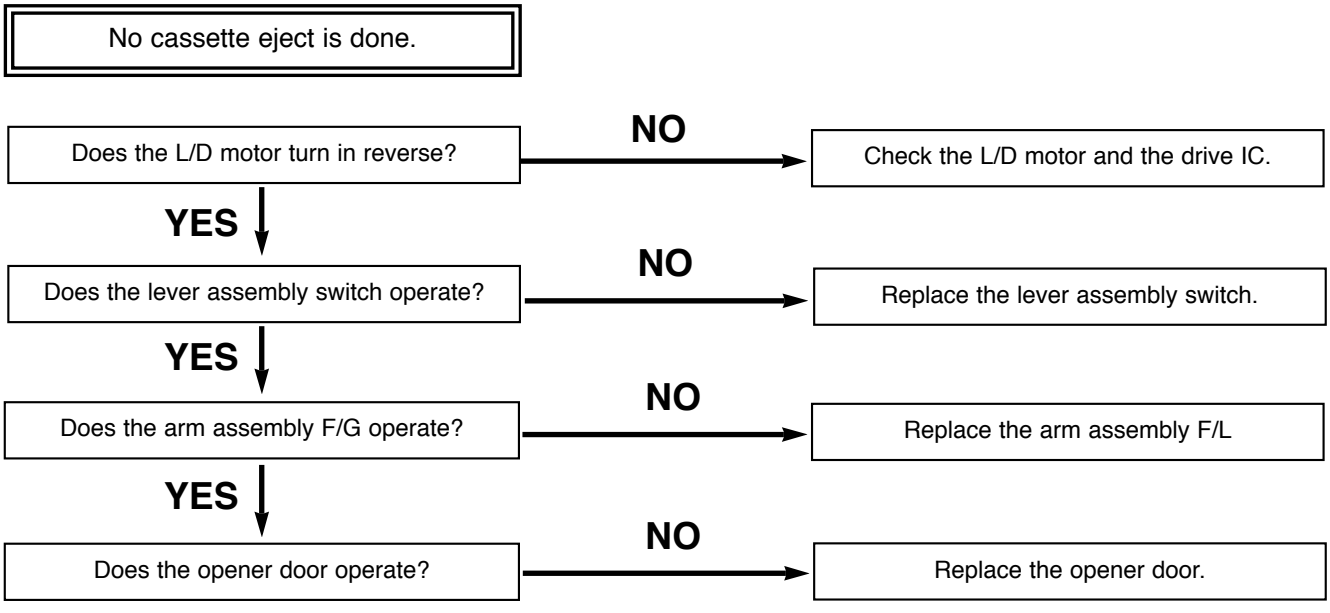

No tape winding is done in play.
Is the pinch roller attached to the Capstan shaft in operation of play?
NO
Check the assembly mode?
YES
Does the T/up reel operate?
NO
Is the Capstan belt hung?
NO
Hang the Capstan belt.
YES
YES
Check the clutch and the idler assembly.
Does the Capstan motor turn?
YES
Does the drum motor turn?
NO
Is normal voltage applied to the capstan motor Vcc1, Vcc2?
YES
YES
Is the DPG, DFG normal?
Is the Vctl terminal voltage of the Capstan motor applied at more than 4V?
NO
Check the Servo, power circuit.
YES
YES
Are the T/up and the reel sensor normal?
Replace the Capstan motor.
YES
NO
Check the Syscon circuit.
Is the Vcc voltage of the drum motor normal?
NO
Check the Syscon circuit.
YES
Is the Vctl terminal voltage of the drum motor at more than 2.3V?
NO
Check the Syscon circuit.
YES
Replace the drum motor.

2. Front Loading Mechanism

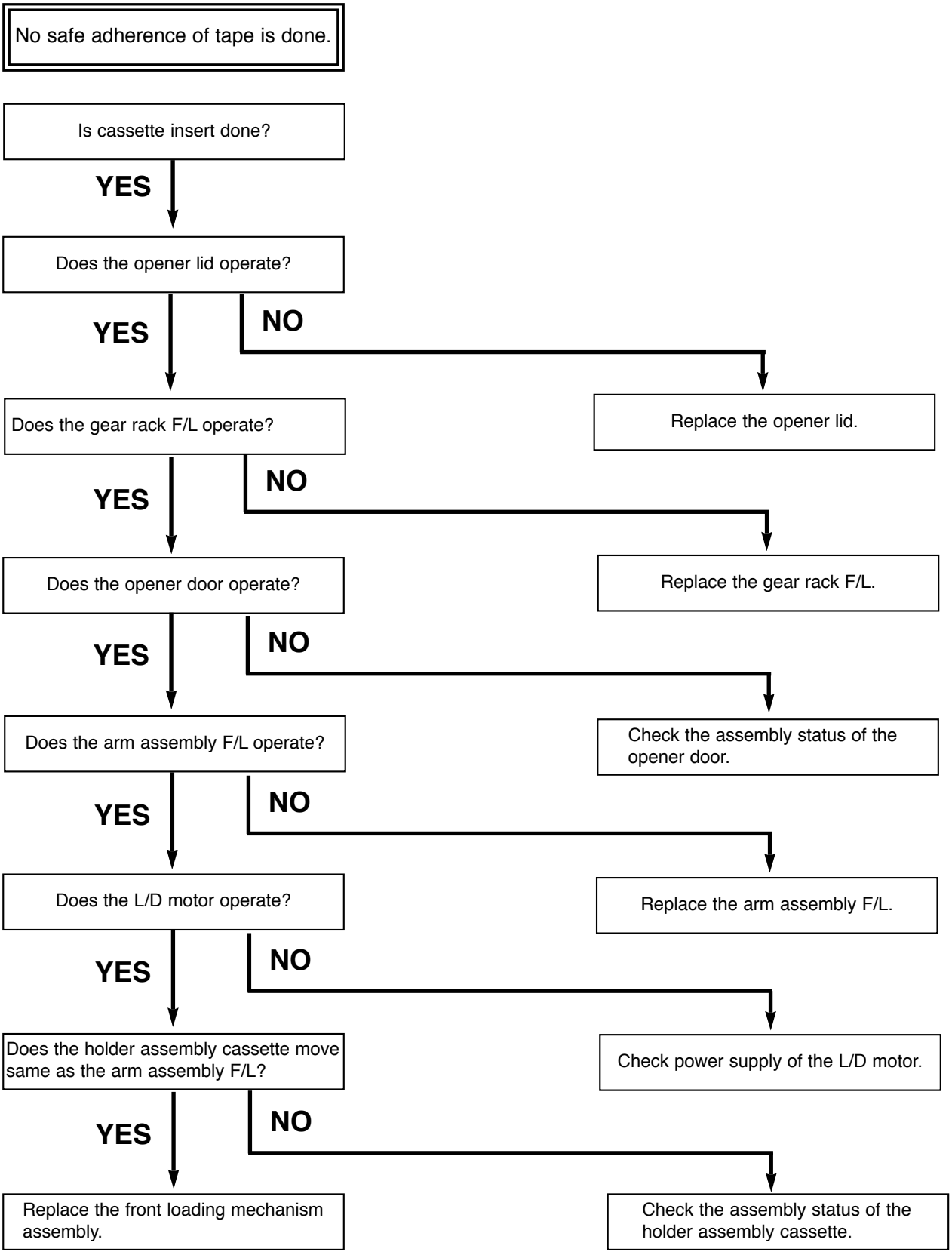
A.


No cassette insert is done.
Does the lever assembly switch operate?
NO
Is the lever assembly switch spring normal?
NO
Add or replace the lever assembly switches spring.
YES
YES
Does the CST IN switch operate normally?
NO
Replace the F/L switch.
YES
Is the Vcc of the main P.C.B assembly?
Check the Syscon circuit.
YES
NO
Is voltage between the cassette switch terminal and the GND on the main P.C.B assembly?
Check the power circuit.
YES
NO
Check the mode switch position and the Syscon circuit.
Is there short between the cassette switch terminal and the GND on the main P.C.B assembly?
YES
NO
Replace the main P.C.B assembly or remove the short part.
Replace the CST IN switch.

B.

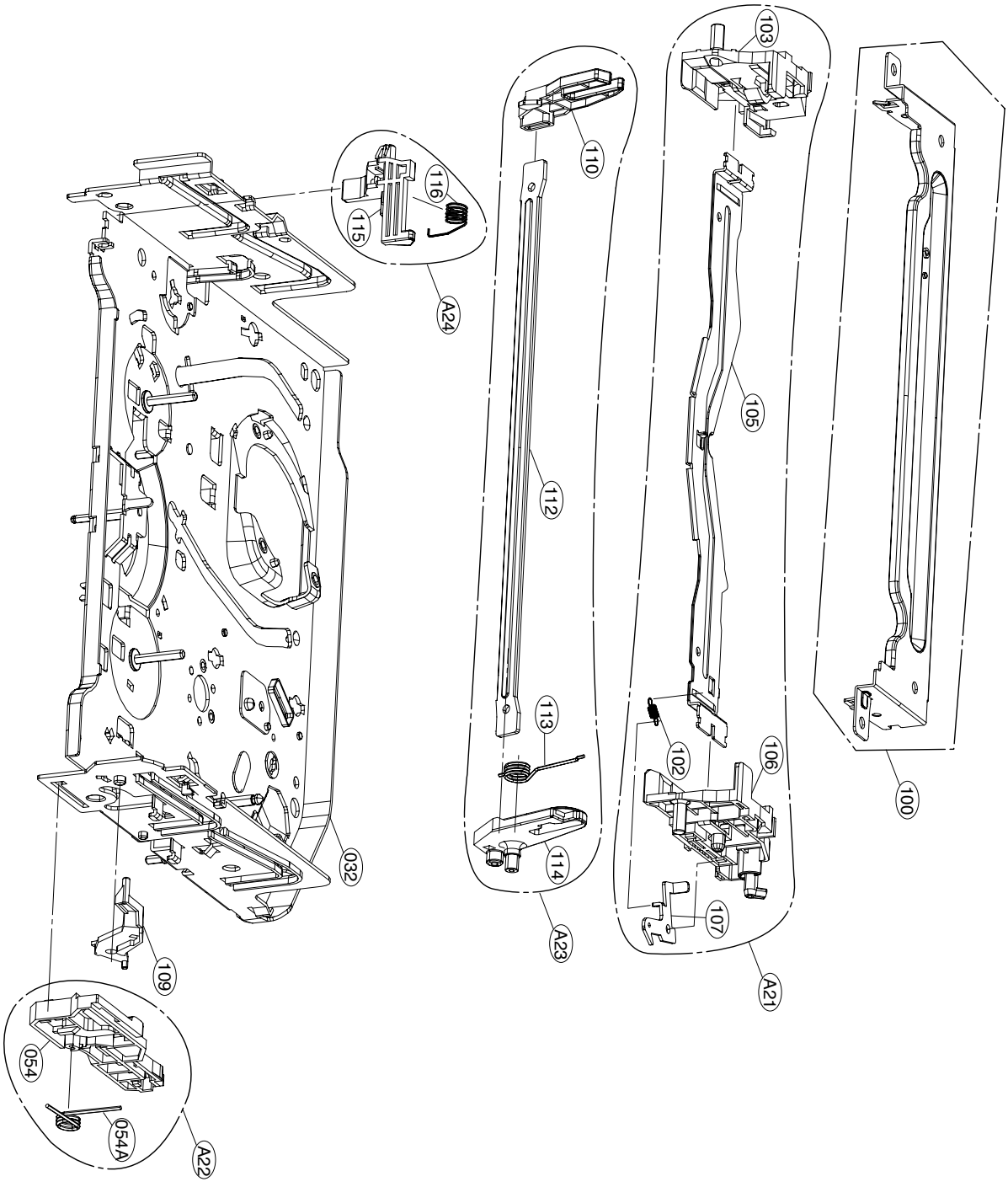


C.


No safe adherence of tape is done.
Is cassette insert done?
YES
Does the opener lid operate?
YES
NO
Replace the opener lid.
Does the gear rack F/L operate?
YES
NO
Replace the gear rack F/L.
Does the opener door operate?
YES
NO
Check the assembly status of the opener door.
Does the arm assembly F/L operate?
YES
NO
Replace the arm assembly F/L.
Does the L/D motor operate?
YES
NO
Check power supply of the L/D motor.
Does the holder assembly cassette move same as the arm assembly F/L?
YES
NO
Check the assembly status of the holder assembly cassette.
Replace the front loading mechanism assembly.

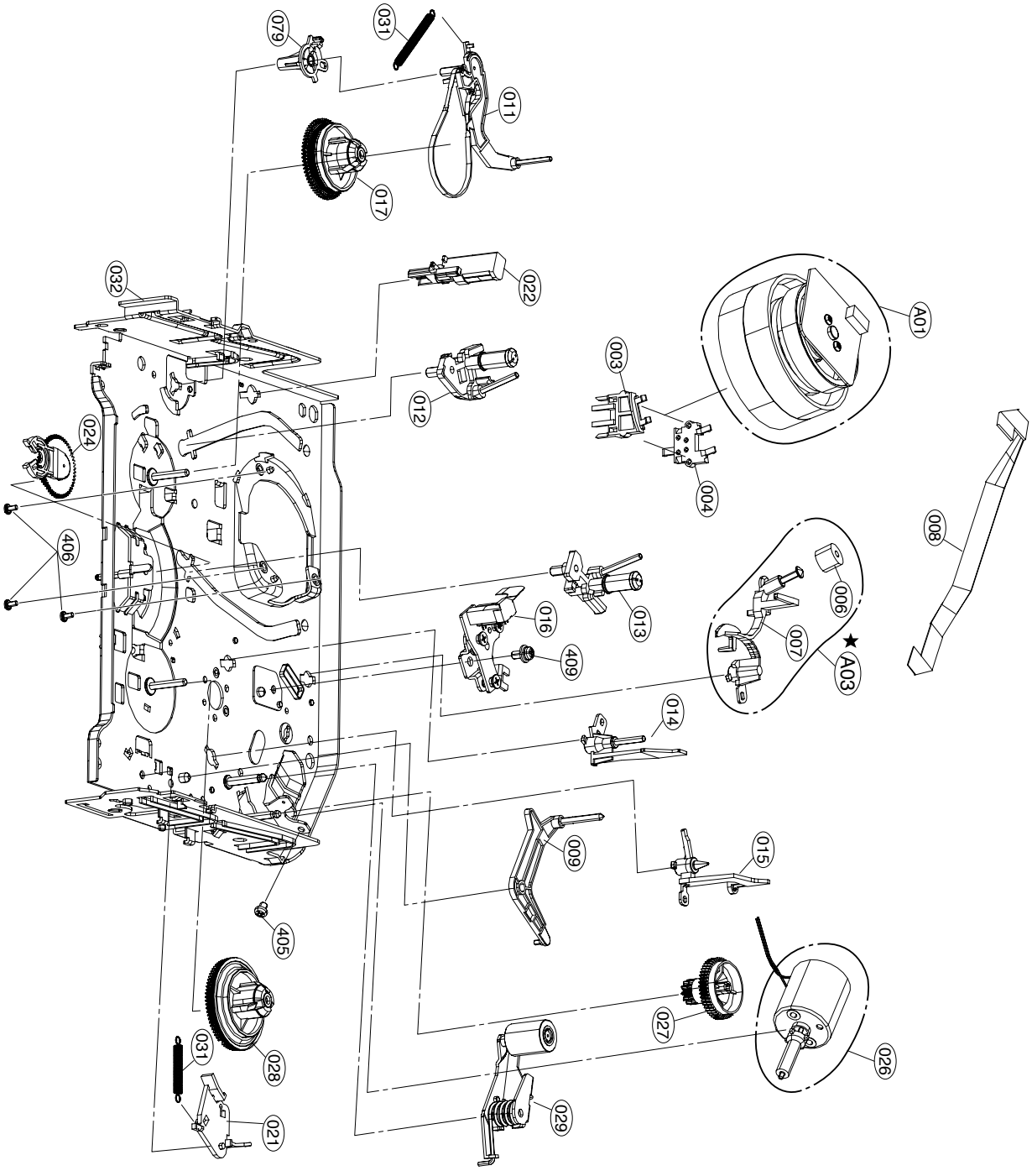
EXPLODED VIEWS

1. Front Loading Mechanism Section

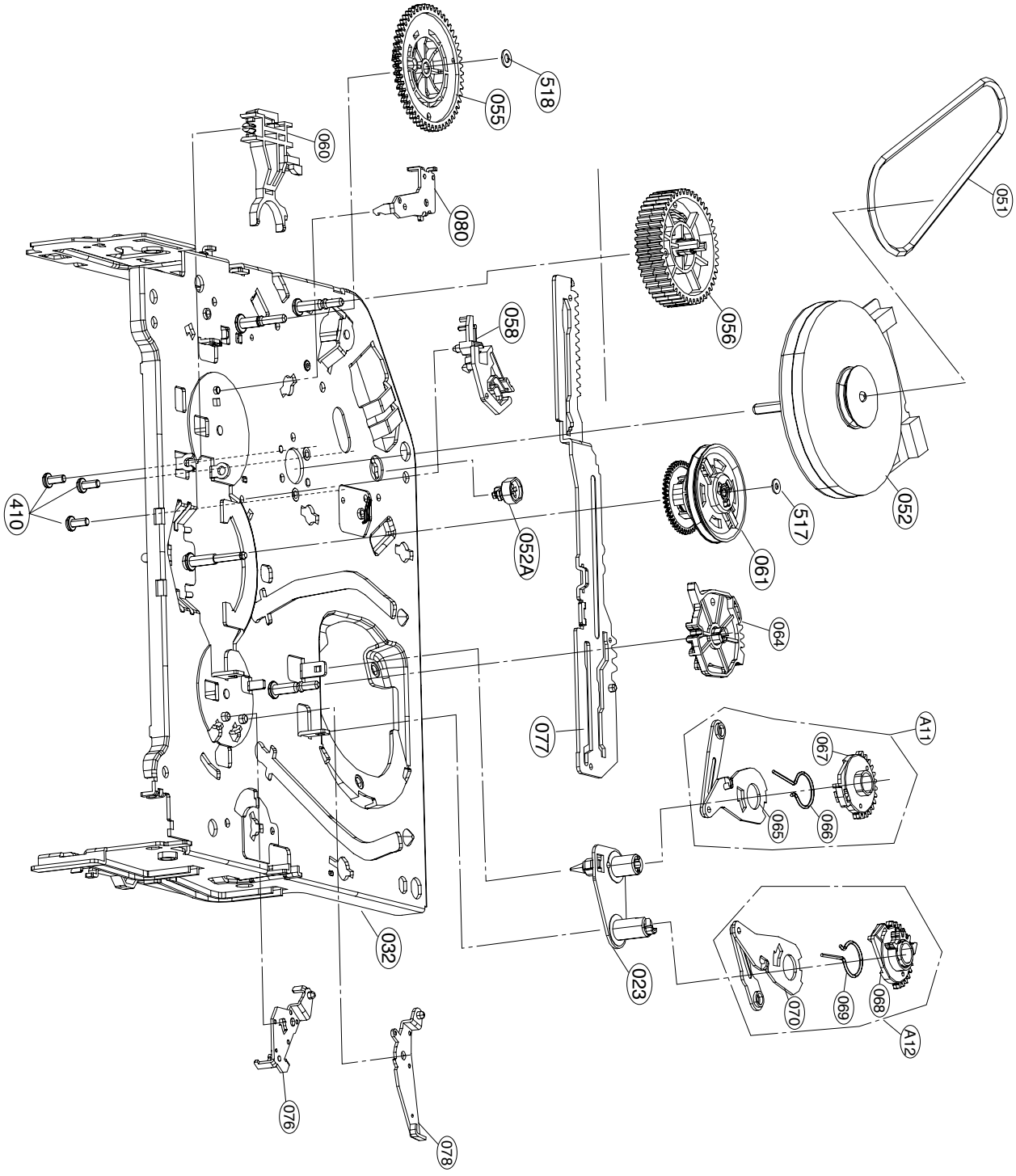


2. Moving Mechanism Section (1)

★ OPTIONAL PART



3. Moving Mechanism Section (2)



MEMO